SEPTEMBER | 1957

products finishing

FINISHES ON METAL PRODUCTS

Table of Contents	Page 5
Aircraft Finishing Methods	Page 36
Courses in Finishing	Page 50
Painting Automobile Engines	Page 54
Treatment of Plating Waste	Page 60
Finishing Clinic	Page 84
What's New?	Page 108

A REGULAR DIP IN YOUR TANK makes sure your finish performs . . . at both ends of the line!

Keeping a watchful eye on your finish, even after it is delivered, is one of the ways Sherwin-Williams safeguards trouble-free performance of your finish . . . on the production line *and* on your product in use.

For instance, on dip tank operations ranging from 1,500 gallons to 5,000 gallons and more, Sherwin-Williams Technical Servicemen regularly take samples to be sent to the laboratory for stability checks. Viscosity, specific gravity, drying time, skinning, settling, film gloss and shade among other things, are checked against original formulation.

You get a report with any necessary adjustments recommended. This assures smooth production line operation as well as customer satisfaction . . . *both* ends of the line are covered.

Whether you make appliances, furniture, or metal or wood products of any kind, make sure at both ends of *your* line. For facts, call your nearest Representative, or write: The Sherwin-Williams Co., General Industrial Division, Cleveland 1, Ohio. In Canada: 2875 Centre Street, Montreal.

SHERWIN-WILLIAMS INDUSTRIAL FINISHES

For more data circle **301** on Reader Service Card

(THIS CARD VOID AFTER NOVEMBER 1, 1957)

1	17	33	49	65	81	97	113	129	145	301-2nd Cover	330	346	362	378	394	410	426	442
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3	19	35	51	67	83	99	115	131	147	303-4th Cover	332	348	364	380	396	412	428	444
4	20	36	52	68	84	100	116	132	148	304	317	333	349	365	381	397	413	429	445
5	21	37	53	69	85	101	117	133	149	305	318	334	350	366	382	398	414	430	446
6	22	38	54	70	86	102	118	134	150	306	319	335	351	367	383	399	415	431	447
7	23	39	55	71	87	103	119	135	151	307	320	336	352	368	384	400	416	432	448
8	24	40	56	72	88	104	120	136	152	308	321	337	353	369	385	401	417	433	449
9	25	41	57	73	89	105	121	137	153	309	322	338	354	370	386	402	418	434	450
10	26	42	58	74	90	106	122	138	154	310	323	339	355	371	387	403	419	435	451
11	27	43	59	75	91	107	123	139	155	311	324	340	356	372	388	404	420	436	452
12	28	44	60	76	92	108	124	140	156	312	325	341	357	373	389	405	421	437	453
13	29	45	61	77	93	109	125	141	157	313	326	342	358	374	390	406	422	438	454
14	30	46	62	78	94	110	126	142	158	314	327	343	359	375	391	407	423	439	455
15	31	47	63	79	95	111	127	143	159	315	328	344	360	376	392	408	424	440	456
16	32	48	64	80	96	112	128	144	160	316	329	345	361	377	393	409	425	441	457

NAME_____ POSITION_____

COMPANY_____

STREET_____

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4	20	36	52	68	84	100	116	132	148	304	317	333	349	365	381	397	413	429	445
5	21	37	53	69	85	101	117	133	149	305	318	334	350	366	382	398	414	430	446
6	22	38	54	70	86	102	118	134	150	306	319	335	351	367	383	399	415	431	447
7	23	39	55	71	87	103	119	135	151	307	320	336	352	368	384	400	416	432	448
8	24	40	56	72	88	104	120	136	152	308	321	337	353	369	385	401	417	433	449
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12	28	44	60	76	92	108	124	140	156	312	325	341	357	373	389	405	421	437	453
13	29	45	61	77	93	109	125	141	157	313	326	342	358	374	390	406	422	438	454
14	30	46	62	78	94	110	126	142	158	314	327	343	359	375	391	407	423	439	455
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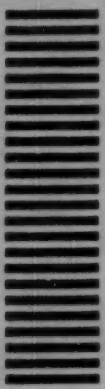


HAVE YOU TRIED THIS EXTRAORDINARY CLEANER?

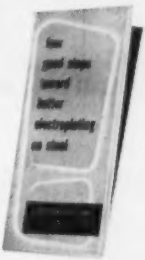
Oakite Rustripper removes rust and heat scale in the same operation that removes oil. It avoids hydrogen embrittlement, damage to machined surfaces and other disadvantages of acid pickling.

Have you taken the four good steps?

How can cleaning costs be reduced 33% while cleaning quality is being improved? *See pages 7 and 8 of booklet.*

What are four easy ways to improve the average rinse tank? *See page 10.*

What causes hydrogen embrittlement during electrocleaning? What is the remedy? *See pages 15 and 16.*



Do you need a brass cleaner that gives better protection against tarnishing?

Oakite has a new brass cleaner that provides scientific protection against the oxygen that tarnishes brass and other copper alloys during the application of reverse current.

OAKITE PRODUCTS, INC.
20 Rector Street, New York 6, N. Y.

Send me the FREE booklets indicated below:

- ☐ Here's the best shortcut in the field of electroplating
- ☐ Four good steps toward better electroplating on steel
- ☐ What's NEW for electrocleaning brass and other copper alloys

NAME_____

COMPANY_____

ADDRESS_____

FREE
For further information, ask for booklet

OAKITE

For more data circle **304** on Reader Service Card

Wheels coated with ALUNDUM abrasive give housing covers a fine polish, faster and for less money — like other Norton "Touch of Gold" grains that cover the widest range of polishing operations. ▶

Setting up the wheels shown at right is an easy job. The high capillarity of ALUNDUM polishing grains improves and speeds up the wetting process with glue or cement.

How polishing costs are being cut...NOW

Trend to wheels set up with ALUNDUM abrasive is spreading the money-saving "TOUCH OF GOLD"*

Many plants where polishing jobs are important find that a change-over to wheels set up with Norton ALUNDUM abrasives results in better, faster, lower-cost polishing.

In particular, preferences for S and R type grains are increasing rapidly. The S type, available in 14 to 90 grit sizes, is specially surface-treated to give the abrasive much greater adhesion to glue or cement. The R type, made in 100 to 240 grit sizes, also gets a special surface treatment, to improve its adhesiveness for use with glue only.

Typical advantages common to all ALUNDUM polishing grains include:

- **Uniform grain shape,** that assures a fast, uniform cutting action.
- **Uniform grain sizings,** with no oversize grains that mar the finish, no undersize grains to loaf on the job.
- **High capillarity,** assuring the easy absorption of adhesive that means longer lasting, better performing set-up wheels.

The booklet "Setting Up Metal Polishing Wheels and Belts" contains valuable facts on the various types of ALUNDUM grain . . . on the applications of canvas, leather or wooden wheels . . . and on the best means of preparing wheels, with cement or glue. Ask your Norton distributor for it. Or write to NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors all around the world.

G-335

*Trade-Mark Reg. U.S. Pat. Off. and Foreign Countries

NORTON
ABRASIVES

Making better products... to make your products better

NORTON PRODUCTS
Abrasives • Grinding Wheels • Grinding Machines
Refractories

BEHR-MANNING DIVISION
Coated Abrasives • Sharpening Stones
Behr-cat Tapes

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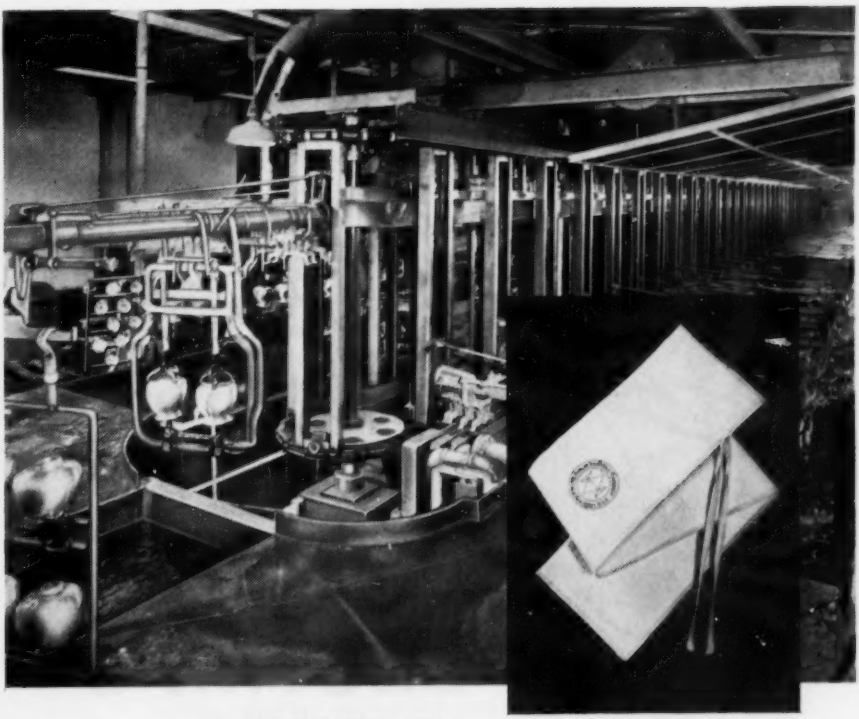

WHY H-VW-M ANODE BAGS
CAN CUT DOWN PLATING ROOM REJECTS

Everything that goes into the plating bath has some effect on the finished product. And, when you think about it, nothing can have a more *direct* effect on plating results than the bag that holds the anode. You may use the finest chemicals . . . the best anode stock. Yet the job can be ruined by harmful chemicals in the bag material, or made less efficient by a bag of inadequate design.

THAT'S WHY IT PAYS to get H-VW-M anode bags. They cost no more, yet each is designed like a fine tool . . . engineered to give top performance in *specific* plating operations. This fine quality and precise engineering pays off in faster work, finer finishes—and fewer rejects.

Look for these features when you buy anode bags. You get them *all* with H-VW-M.

- **Wide selection of materials.**
- **Laboratory and field electrochemical service.**
- **Completely desized and pre-shrunk fabrics.**
- **No organic impurities of any kind.**
- **Minimum wear . . . longer life.**
- **Low, competitive price.**

MADE ONLY OF LABORATORY-TESTED MATERIAL

You can be sure that every H-VW-M anode bag you buy is free from any matter which can prove harmful in the plating process. In modern H-VW-M laboratories, experts in plating chemistry constantly test anode bag materials under actual shop conditions. Only the purest pass these rigid tests.

For diaphragm operation – H-VW-M can supply you with equipment to meet your needs. Write today for further information and prices.

Hanson-Van Winkle-Munning Company, Matawan, New Jersey. Offices in principal cities.

H-VW-M

Industry's Workshop for the Finest in Plating, Anodizing, and Polishing Processes · Equipment · Supplies

PLATEMANSHIP—Your H-VW-M combination—of the most modern testing and development laboratory—of over 80 years experience in every phase of plating and polishing—of a complete equipment, process and supply line for every need

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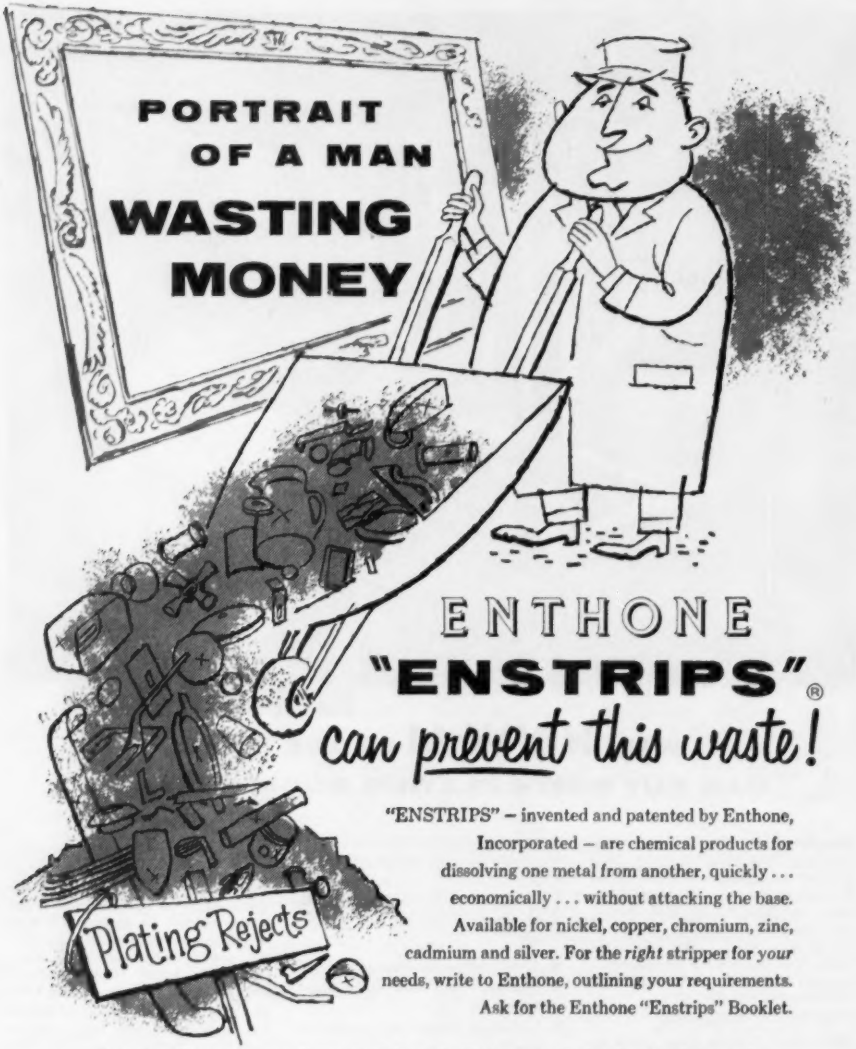

ENTHONE "ENSTRIPS"® *can prevent this waste!*

"ENSTRIPS" – invented and patented by Enthone, Incorporated – are chemical products for dissolving one metal from another, quickly . . . economically . . . without attacking the base. Available for nickel, copper, chromium, zinc, cadmium and silver. For the *right* stripper for *your* needs, write to Enthone, outlining your requirements. Ask for the Enthone "Enstrips" Booklet.

Service Representatives and Stock Points in Principal Cities of U.S.A. and Canada, Brazil, England, France, Sweden, and Germany

ENTHONE INCORPORATED

442 ELM STREET, NEW HAVEN 11, CONNECTICUT

Metal Finishing Processes • Electroplating Chemicals

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products finishing

Vol. 21 No. 12 September, 1957

FEATURES IN THIS ISSUE:

31 Management Abilities for the Engineer • *By Roger M. Kyes*
36 Finishing Military Aircraft • *By Ezra A. Blount, Editor*
50 Training Courses in Finishing
54 Painting Chevrolet V-8 Engines • *By Gerard H. Poll, Jr., Associate Editor*
60 What To Do Until the Waste Expert Comes • *By George E. Glover*
72 Spotlighting Finishing Progress
72 —Electroplating from Organic Solutions
86 Practical Applications of Modern Products
86 —New Finishing System Sends Parts to Assembly 15 Minutes After Fabrication
87 —Flame-Plated Valve Fights Heat and Abrasion
90 —Specialty Stainless Steel Used in Corrosive Pickling Operations
92 —Large Machine Cleans Cast Iron Parts
94 —Hot Water Heating Proves Economical and Efficient for Heating Tanks
96 —Filter Fabrics of Synthetic Fibers Aid in Filtration of Corrosive Liquids
98 —Plastisol-Coated Racks Protect Jet Burners from Scratches
100 —Acid-Resistant Work Clothes Improve Efficiency in Metal Finishing Plant
102 —Heater Manufacturer Avoids Redesigning by Using Silicone Finish

6 Advertising Representatives

DEPARTMENTS:

84 Finishing Clinic
108 New Equipment, Materials, Processes
152 News of the Industry
167 Meetings of Interest to Finishers
168 Product Literature
173 Classified Advertising
174 The Finishing Touch
176 September Advertisers' Index

Member
BPA NBP

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For Buffing IRREGULAR SHAPES

NEW 6" wide buff finger *features* **CHURCHILL Finger-Buff* # 501**

Here is a brand new buff that has **proven** its worth for buffing large irregular shapes without excessive wear on any part of the face. This new Churchill Finger-Buff* #501, with the 6" wide buff finger, has **proven** to run at cooler temperatures, to last longer, and to wear down uniformly!

For low cost, cutting **and** coloring stainless and die castings, especially for irregular shapes, specify this super-flexible Churchill Buff #501.

• Churchill Finger-Buffs* are made from sisal or cloth; always bias-cut and top grade material; in all sizes from 3" to 21" diameters.

*Churchill Finger-Buff, T.M. Reg. U. S. Pat. Off.

REPRESENTATIVES IN PRINCIPAL CITIES

Geo. R. Churchill Co., INC. FREE Catalog

Dept. PF, Hingham, Mass.

Please send me FREE Catalog and complete information. My special buffing problem is .....

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Firm .....

Street .....

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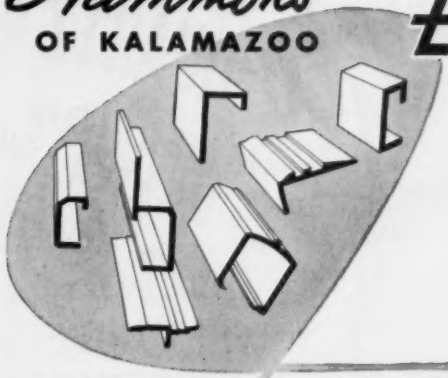
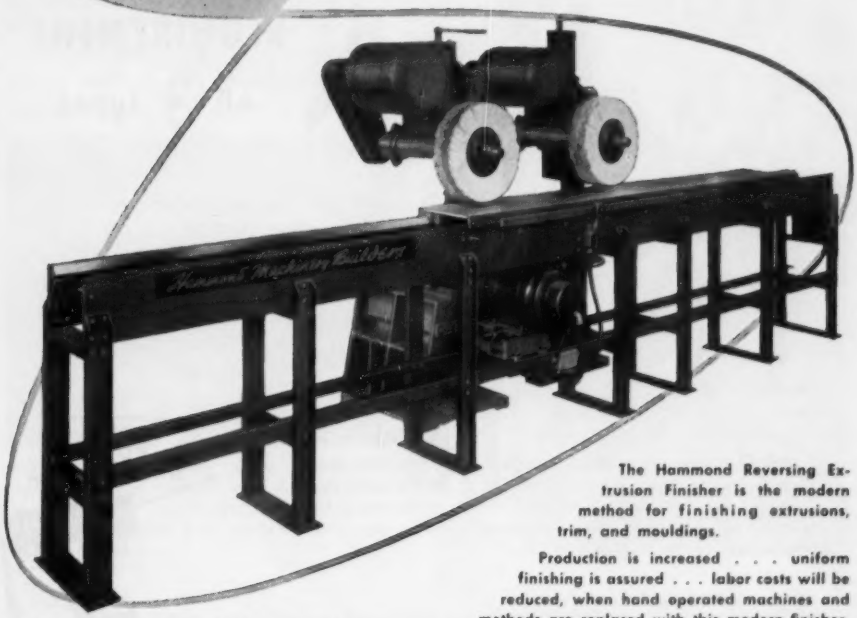
Circulation over 21,000— largest in the finishing field

Hammond
OF KALAMAZOO

REVERSING EXTRUSION FINISHER

for LOW COST, VOLUME PRODUCTION FINISHING OF EXTRUSIONS, TRIM AND MOULDINGS





Two-Head Machine shown . . . any number of heads, and length of conveyor, can be supplied to suit your job.

The Hammond Reversing Extrusion Finisher is the modern method for finishing extrusions, trim, and mouldings.

Production is increased . . . uniform finishing is assured . . . labor costs will be reduced, when hand operated machines and methods are replaced with this modern finisher.

SEND SAMPLES and we will show you how much you can speed up production and cut costs.

Hammond Machinery Builders INC.

1622 DOUGLAS AVE. • KALAMAZOO, MICHIGAN

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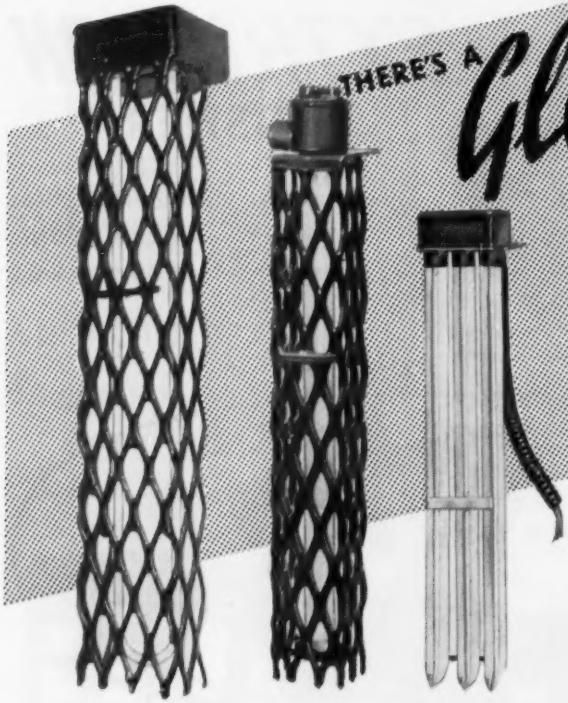
The Leading Name in Immersion Heating



THERE'S A **Glo-QUARTZ*** IMMERSION HEATER for YOUR EVERY HEATING REQUIREMENT

All 3 Types

- INSTANT HEATING
- SHORT-PROOF
- AVAILABLE IN ALL VOLTAGES—WATTAGES, one and three phase
- STOCKED FOR IMMEDIATE SHIPMENT

TYPE "U"

PATENT PENDING
World's **first** successful U-tube **ACID** Heater—Guaranteed to outperform and outlast all other quartz heaters.

TYPE "GN"

Pat. No. 2,740,881
Standard straight tube Quartz **ACID** Heater—Vapor-proof junction box; replaceable heating element.

TYPE "MB"

"Multi-Blade", Metal-sheathed **ALKALI** Heater—Portable, burn-out proof, easy mounting, long life.

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If you're looking for
ACCURACY—EFFICIENCY—LONG LIFE—and ECONOMY
...you'll get it with Glo-QUARTZ!
Available from your Electroplating Distributor!

Glo-QUARTZ ELECTRIC HEATER CO., INC.
*Trademark Reg. U.S. Pat. Off. **WILLOUGHBY, OHIO** Phone: Willoughby 2-5521

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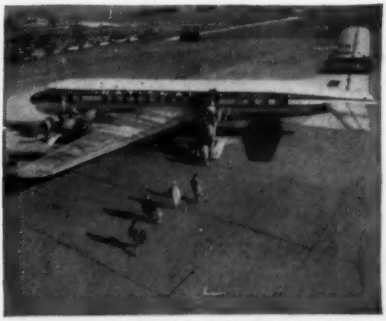
ACP Alodine® ANCHORS THE FINISH,

PERMITS FORMING AFTER PAINTING

Users of strip aluminum find that ACP Alodine anchors the finish so firmly to the metal that it can be roll formed after painting without damaging the finish. The chemical coating formed by this ACP product becomes an integral part of the metal, bars corrosion, adds years to the life of the metal. It offers a two-fold economy—it is inexpensive and it permits scratches in the coating to be quickly and easily repaired.



BOTH COMMERCIAL AND MILITARY AIRCRAFT are treated with ACP Alodine to protect the metal and improve paint adhesion. Quality and economy are two important reasons.

In the processing of aluminum strip for awnings, the Alodine process has cut operating costs as much as 33%, increased production as much as 50%.

LEARN MORE ABOUT ACP ALODINE. Bulletin 1424 describes the various types of ACP Alodine and gives information which will help you select the proper one for your particular application. Write for your copy today.

AMERICAN CHEMICAL PAINT COMPANY, Ambler 14, Pa.

DETROIT, MICH. • ST. JOSEPH, MO. • NILES, CALIF. • WINDSOR, ONT.

CHEMICALS ACP PROCESSES

New Chemical Horizons for Industry and Agriculture

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Barrel Plating by Stevens Really Cuts Costs

Since Stevens first introduced the Automatic Barrel machine scores of industries have enjoyed these operational advantages. Check them against your present operations.

MINIMUM LABOR REQUIRED — In most cases, one unskilled employee can operate the machine.

HANDLES THE COMPLETE CYCLE — Including cleaning, pickling, chromate treatments, plating, bright dip and drying.

COMPLETELY AUTOMATIC — No barrel lids to fasten and unfasten during automatic loading and unloading.

BETTER HANDLING — No mixing of parts. Becomes a part of a straight line production system.

NO HEALTH HAZARD — Occupational health hazards eliminated with ventilation of equipment.

UNIFORMITY OF PLATE — Accurate plating cycles timed to meet your requirements.

FITS ANY PLANT LOCATION — Does not need special buildings—Can be moved at any time. Low head room.

DEPENDABLE — Scores of machines in use. Machine design and construction constantly improved.

LOW INITIAL COSTS — For average operation lowest initial machine costs.

LOW MAINTENANCE COSTS — Proven over years of use and in varied operations.

FREDERIC B. STEVENS
INCORPORATED
YOUR METAL FINISHING SUPERMARKET
DETROIT 16, MICHIGAN

Let a Stevens Sales Engineer show you how you can cut costs in your plating operation with a Stevens Automatic Barrel. Write us direct Frederic B. Stevens, Inc., 1816-18th Street, Detroit 16, Michigan

METAL FINISHING EQUIPMENT AND SUPPLIES, FROM CASTINGS OR STAMPINGS TO FINISHED PRODUCT

BRANCHES:
Buffalo • Indianapolis • New Haven
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now more lustrous than natural

Pearl *essence*

To the pearly beauty of Nacromer we've now added more lustre – in fact, new Nacromer YNC is equal to or more lustrous than the finest grades of natural pearl essence.

AS EASY TO USE AS EVER

Brush, spray, or dip – whatever method of application you use, Nacromer YNC requires no additional labor or equipment. Simply add a small amount to your regular coating material–that's all there is to it!

STILL LOW COST

It takes such a small quantity of Nacromer YNC to create a unique finish that the added cost for your product is negligible. And, Nacromer YNC is versatile too! You can use it on any sealed surface–wood, metal, plastic, leather, paper, etc.

NEW NACROMER YNC

Yes, new Nacromer YNC will give your product more sales appeal, a richer look. Why not see for yourself how this beautiful "more lustrous than pearl" Nacromer YNC can help you? Write today for additional information. (Please specify nature of the coating vehicle used.)

the Mearl corporation

"World's Largest Producers of Pearl Essence"

124 East 40th Street, New York 16, N. Y.

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FIORE

MASKS FOR PRECISION PAINTING

Fiore Spray Masks are used on plastics, stampings and die-castings that have depressed or raised detail and on any other irregular shaped surface. If a product can be molded, stamped or die-cast, it can be decorated by Fiore spray masks.

Over ten years many manufacturers have been decorating their products by using Fiore spray-masks, associated jigs, fixtures and spray machines. Fiore Spray Masks and accessories are simple to use. An unskilled worker can operate them without special training and obtain perfect duplication and greater speed at a minimum cost.

Send for your free copy of our 20 page book. Or, send your samples and drawings for consultation and estimates.

WM. M. FIORE, INC.

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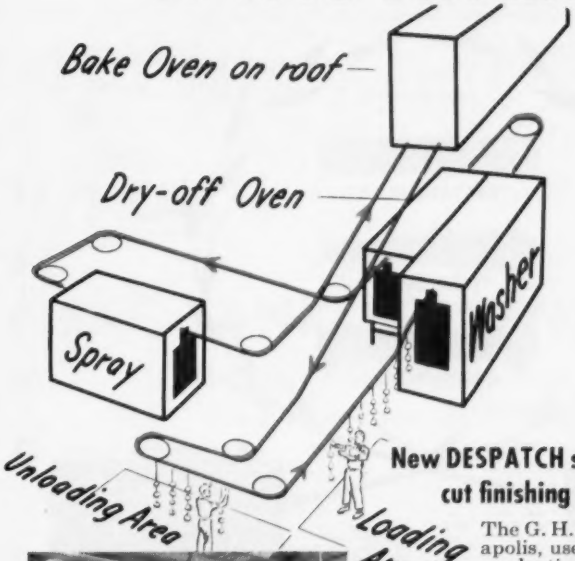
FASTER, BRIGHTER PAINTING OF 1000 DIFFERENT PARTS!

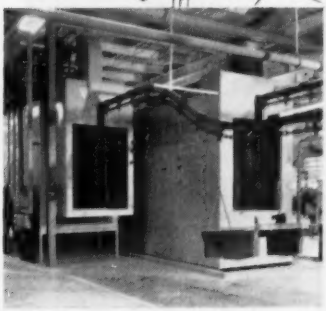


FLOW DIAGRAM shows perspective (not actual scale) of new metal processing and paint finishing system in the G. H. Tennant Company's new plant. Conveyor is 500 ft. long; travels 8 ft. per minute. The 74 ft. bake oven is built on the roof to save floor space. Just-sprayed parts travel up and into the oven through its underside opening. Baking lasts eight minutes at 330° F.

New DESPATCH system helps Tennant Co. cut finishing time 80 man-hours to 24

The G. H. Tennant Company, Minneapolis, used to have trouble painting production quantities of 1000 different parts for their power sweepers, floor machines, scarifiers, roof scrapers, and concrete routers. This new DESPATCH continuous-conveyor finishing system speeds washing and drying of *all* parts (they weigh from ounces to 800 pounds) and speeds spraying and baking of the prime coat and the bright orange or cream finish coat. The system enables Tennant to do in 24 man-hours what used to take 80 man-hours, and assures a superior finish.

The entire system was engineered, built and installed by DESPATCH in cooperation with the Tennant Company. DESPATCH can help you. There's a DESPATCH-trained resident engineer near you . . . talk to him about your finishing requirements.



ALL PARTS first enter 3-stage 44 ft. washer at right, then return through 34 ft. dry-off oven at left. Note master control panel alongside dry-off oven. In washer, surface of metal parts is converted to iron-phosphate coating to prevent rust and corrosion. Temperature of dry-off oven is varied from 350° to 400° F., depending on size of parts.

WRITE TODAY FOR BULLETIN 51C

16 colorful pages on modern ways to achieve better finishes, faster production and smoother handling of metal products . . . at lower cost.

DESPATCH OVEN COMPANY

619 S. E. Eighth St., Minneapolis 14, Minn.

Sales and Service in All 26 Principal Cities

PIONEERS IN ENGINEERING FINISHING SYSTEMS FOR INDUSTRY

For more data circle **315** on Reader Service Card

SHAPED, EXTRUDED ANODES

3 STANDARD SHAPES
"RECTANGULAR"
"TEAR DROP"
"DOG BONE"
ROLLED FLAT PLATE ANODE SECTION:
This Photomicrograph shows highly irregular, uncontrolled grain size—a major cause of shedding and resultant rough electrodeposits.
Note small, fully controlled regularity of grain size that promotes uniform corrosion, smoothest electrodeposits, less rejects.
APW EXTRUDED ANODE SECTION:

THE GREATEST ANODE DEVELOPMENT IN YEARS

APW Shaped, Extruded Anodes were developed to extend the useful life of our anodes . . . to assure uniform and consistently smooth electrodeposits . . . to minimize shedding. They accomplish these objectives for our customers day after day—and in addition, *they have helped to lower plating costs!*

The anodes are scientifically shaped to retain 80% of original surface area *after 85% by weight has been plated off!* You get longer anode life, minimized polarization and less silver scrap to be refined.

The APW Extrusion Process* assures small, uniform grain size controlled between definite, ideal limits. Corrosion is smooth, shedding is virtually eliminated, rejects are a comparative rarity.

Be certain the silver you buy in anodes is used most efficiently and economically. Our service department will be glad to develop special anode shapes to meet your particular plating bath conditions. Call or write for a representative, we'll be glad to assist with your anode problems. ★ ★ ★ ★ ★ ★

*Pat. Pending

THE AMERICAN PLATINUM WORKS

231 NEW JERSEY RAILROAD AVENUE • NEWARK 5, NEW JERSEY

APW

ENGELHARD INDUSTRIES

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Continuous ON-THE-LINE STRIPPING

with

RAP® TANK SOLVENT #52

Efficiency Proved Through Daily Use in Many Major Installations

As illustrated RAP Tank Solvent #52 thoroughly cleans conveyor hooks (racks or baskets) with no line down-time. It excels in all other applications, such as removing Scotchlite or Prismo, baked enamels and lacquers etc.

RAP Tank Solvent #52 is: fast and sure, non-flammable, non-caustic, practically odorless, practically non-toxic and will not harm aluminum.

Other RAP products daily meeting industry's needs ——

RAP Metal Bond: Safe and sure for the preparation of metals before painting (iron, steel, galvanized, aluminum, etc.). . . also removes rust.

RAP Flush Off Paint Remover: Widely used for industrial maintenance.

We invite custom formulating for special or unusual applications on cleaners and removing of paints.

Just write, wire or phone . . . for complete technical information.

PHONE TWINBROOK 2-4553 **POCKRANDT, INC.** 1108 MARQUETTE ST. BAY CITY, MICHIGAN

For more data circle **317** on Reader Service Card

Adaptability

Flexibility Mobility

that's what you get in an

Acme G4

POLISHING AND BUFFING MACHINE

Easy adaptability to new work assignments —that's the real measure of usefulness for any basic power unit. The Acme G4 polishing and buffing lathe passes this test with no difficulty on any automatic operation.

This versatile lathe converts from buffing to polishing. On one job it may be stroking or oscillating, on another it may be stationary. The unit requires no superstructure for support. It is adjustable four ways horizontally on its universal base, and two ways on the vertical column. The head angles to any degree from horizontal to vertical and operates in any position.

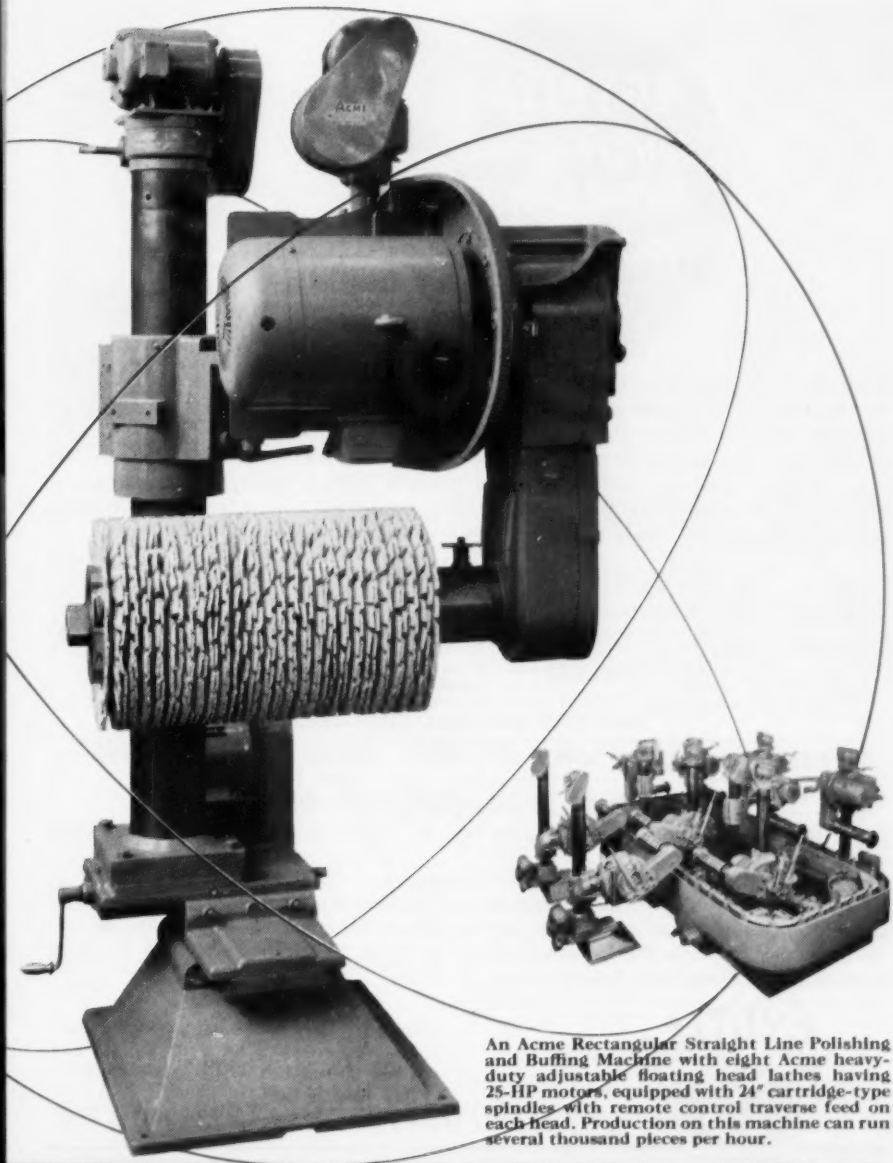
The results of this efficiency in the Acme G4 are: (1) more complete and constant high quality automatic finishing of *unusual shapes,* (2) a general reduction in belt, buffing wheel and compound costs, and (3) complete equipment adaptability to next year's product designs.

To help you combine these Acme G4 lathes with automatic work-holding or fixturing equipment for high-production, low-cost finishing, Acme offers the services of a highly specialized engineering staff. There's no obligation for this consultation service. Give us a call.

LET ACME *Polish Off* YOUR FINISHING PROBLEMS

ACME MANUFACTURING COMPANY

LEADING PRODUCERS OF



An Acme Rectangular Straight Line Polishing and Buffing Machine with eight Acme heavy-duty adjustable floating head lathes having 25-HP motors, equipped with 24" cartridge-type spindles with remote control traverse feed on each head. Production on this machine can run several thousand pieces per hour.

400 E. 9 MILE ROAD, DETROIT 20, MICHIGAN

AUTOMATIC POLISHING AND BUFFING EQUIPMENT SINCE 1910-

For more data circle **318** on Reader Service Card

EGYPTIAN
Kitchen Cabinet
BAKING WHITE
COVERAGE CHECK

Reveals Amazing Economy Hidden in every Gallon Can

41,280 sq. ft. covered at .00929 of a cent per sq. ft.

Routine finishing-room, cost-checks by product manufacturers sometimes bring to light facts about a supplier's product that amaze the supplier himself.

For instance, recently an elated metal kitchen cabinet manufacturer, coating his product with Egyptian Baking White showed us finishing material cost figures compiled during an actual production run.

COVERAGE CHECK

cabinets coated with Egyptian Baking White	564
cabinets recoated	40
total cabinets coated	604

604 Cabinets Coated: each cabinet 68.344 sq. ft. Total Area Coated 41,280 sq. ft.

FINISHING MATERIAL CONSUMED

total gallons Egyptian Baking White	106
total gallons Egyptian Reducer	20

Finishing Material Cost per square foot of Coverage .00929 of a cent

Even in this day of good paint coverage, we think this establishes some kind of a record.

Doesn't it make sense that the Hidden Economy . . . BETTER COVERAGE . . . in every gallon of Egyptian Baking White could reduce your finishing material costs too . . . and at no sacrifice of any required characteristic of a quality finish. Write to-day for detailed information or invite an Egyptian Industrial Finishes Specialist to call on you. No obligation of course.

EGYPTIAN *Industrial Finishes*

The EGYPTIAN LACQUER MANUFACTURING COMPANY

BOX 444, NEWARK 1, NEW JERSEY

EXECUTIVE OFFICES, ROCKEFELLER CENTER, N. Y. • Plants: South Kearny, N. J.—Lafayette, Ind.

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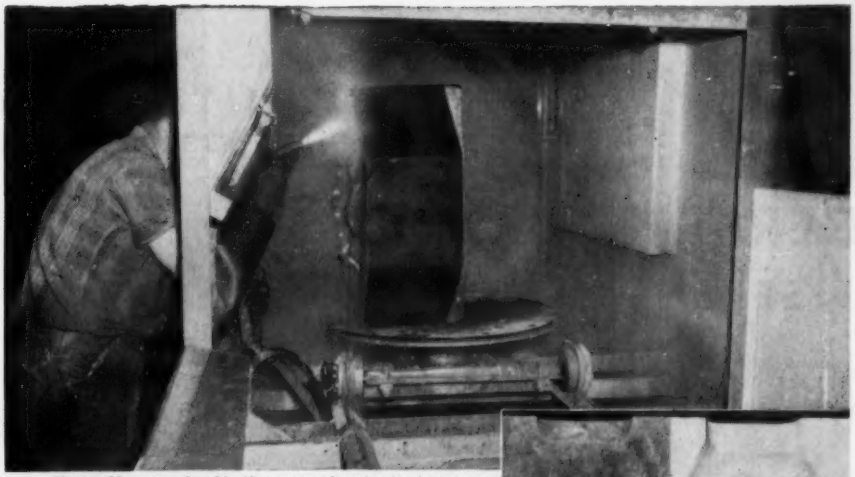

Above: Close-up of a blasting compartment, showing a large forging die in process of cleaning.

Above: Forging Die. One half before blast cleaning, other half after blast cleaning.

Wet blasting with EXOLON *FASTBLAST* reduces costly hand finishing time 97 to 99%

EXOLON (aluminum oxide) abrasive in particles so small they can be suspended in a slurry, are thrown at high speed against the work to be finished. Scales, burrs, carbons, oxides and smeared metal are removed, exposing the virgin metal in a minute, non-directional matte finish.

The rate of finish is controlled by varying air pressure; abrasive size, type and concentration; blast angle and distance of nozzle from work. The abrasive mesh sizes usually are 150, 180, 220 and 240.

Wet blasting produces a chemically clean surface to which plating and other coatings adhere in a permanent bond. Hand finishing requiring 1 to 6 hours was reduced to 30 seconds to 10 minutes by Wet Blasting.

Our technical and research staff will be glad to assist on any problems in the use of EXOLON or CARBOLON.

The EXOLON Company

943 East Niagara Street, Tonawanda, N. Y.
Thorold, Ontario, Canada

All photos courtesy Wheelabrator Corporation, manufacturers of LIQUAMATTE Wet Blasting Equipment.

Manufacturers of SILICON CARBIDE and ALUMINUM OXIDE ABRASIVES

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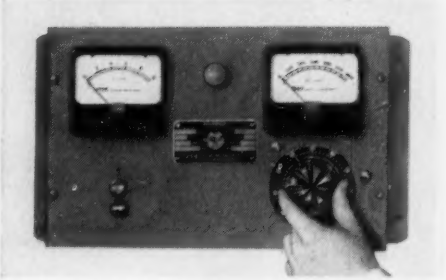
NOW

BALANCED
SINGLE KNOB
STEPLESS CONTROLLED
PLATING RECTIFIERS

GERMANIUM
SELENIUM
SILICON
RECTIFIERS

WITH



"Finger-Tip" Control Panel 10" x 18" x 6"

REACTRON MODIMATIC CONTROLS

- STABILIZED OUTPUT VOLTAGE
- SMALL OPERATOR'S PANEL MOUNTS ANYWHERE
- NO FLOOR SPACE
- SMALL INTERCONNECTING WIRES
- "FINGER-TIP" CONTROL
- NO MOVING PARTS
- LOW MAINTENANCE

Controls all phases simultaneously — Avoids possibility of damaging germanium junctions.

The Ther REACTRON MODIMATIC CONTROL gives you instantaneous, perfect, *stepless* control of plating voltage. Stabilized output produces better plating. Single control knob controls all phases simultaneously...No possibility of damaging germanium junctions by improper setting of 22 or 44 position tap switches.

The miniature operator's control panel furnished with all MODIMATIC CONTROLLED rectifiers gives you "finger-tip" control where you want it. Can be mounted right at the plating tank — Requires no floor space — Measures only 10" x 18" x 6" — needs only #14 wires to control panel.

WRITE TODAY for technical study showing the advantages of Reactron VS. tap switch or motor driven variable auto-transformer controls.

It's THER . . . Whatever your D-C Requirement

THER ELECTRIC & MACHINE WORKS

ESTABLISHED 1915

13A SOUTH JEFFERSON ST. • CHICAGO 6, ILLINOIS

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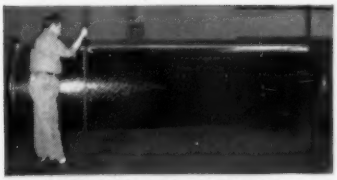
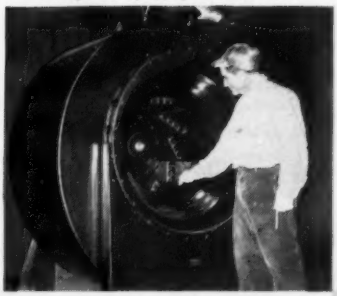
Our years of experience give you . . .

*BALANCED QUALITY**

in MICCROSOL



ABOVE: Large duct section coated by spraying with Miccrosol Spray S-2003. BELOW: Fan housing coated by dipping in Miccrosol E-1003.



Developed originally as a coating for plating racks, Miccrosol E-1003 has all the desirable characteristics which make it an ideal coating for many other applications.

The chemical resistance of Miccrosol is unequalled in its field. Its toughness, abrasion resistance, resilience, and flexibility are unsurpassed. It's easy to apply in either a *dip* or *spray* formula. When necessary, it's easy to repair.

Year after year we build this quality into Miccrosol, improving it whenever possible and practicing every economy in its manufacture that does not compromise the excellence of the product.

This BALANCED QUALITY enables you to use Miccrosol *profitably* while assuring your customers of coating jobs that will prove superior in their performance.

**Outstanding performance and value*

For tanks, ducts, and other equipment

Developed and manufactured by experienced platers and coaters

MICHIGAN CHROME *and Chemical Company*

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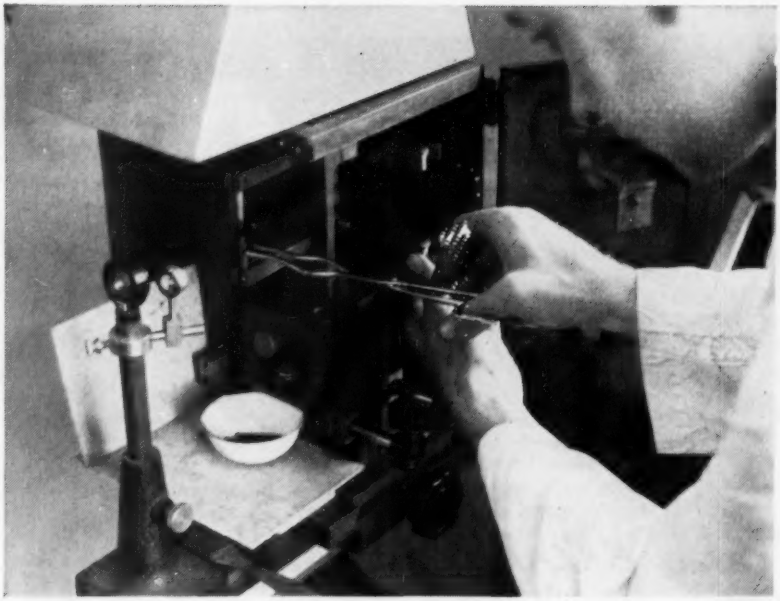


"We put a part of our company in every product"

"I guess you'd call our company a family business. My brothers and I have worked here almost as long as we can remember . . . and our Dad before us.

"We're not a big company as big companies go, but a few years ago we set out to make our Quality Control Lab one of the finest in the industry. We staffed it with men who are highly regarded and spent thousands upon thousands on test equipment . . . including the finest Spectrographic Instrument available. It took a lot of doing—and plenty of dollars, but it was worth it. We've grown steadily and it sure is a nice feeling to know that many of our regular customers include the finest platers in the country."

If you are a user of Copper, Nickel or Zinc Anodes, and if quality (at a competitive price) is an important factor to you, contact us! We manufacture them in a variety of sizes and shapes, and we can make them to your specifications.

Al Kerzner, *President*

NEW JERSEY METALS COMPANY **724 Rockefeller St., Elizabeth 2, N. J.**

Serving Industry from Coast to Coast — since 1920

ELizabeth 4-6336

For more data circle **323** on Reader Service Card

FREE *new* BOOKLET *tells how to get* BETTER PAINT ADHESION

MAIL COUPON TODAY

TURCO PRODUCTS, INC.
6135 South Central Ave., Los Angeles 1, Calif.

Please send me your free phosphating booklet and ready reference chart.

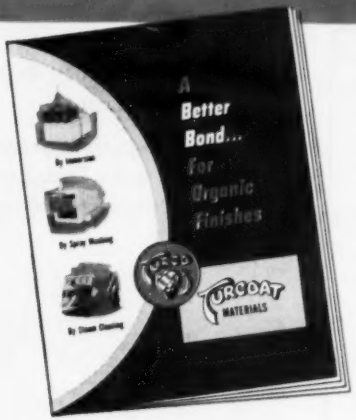
NAME_____

TITLE_____

FIRM_____

ADDRESS_____

PF



Complete PHOSPHATING Reference Chart Includes:

- Description of phosphating
- Diagram of how phosphating holds paint to metal
- Illustrations of what phosphating can do
- Types of coatings available
- Recommended uses
- Applicable Government Specifications
- Methods of application and equipment requirements
- Metals to be used on
- Coating weights
- Detailed operation cycles

Here... in the free Turcoat phosphating booklet... is the best solution to any paint adhesion problem. This new booklet describes the *complete* line of Turcoat materials—the coating compounds that assure *permanent* paint adhesion, slash rejects, require less complicated controls and are more economical to buy and use.

Only Turco offers a truly full line of government approved coating materials for use in *any* conceivable processing set-up prior to the use of organic finishes. Only Turco offers a staff of 160 technically trained representatives located in all parts of the country to give immediate 'round-the-clock service. No wonder Turco is adding new phosphating accounts at a phenomenal rate. There are many reasons why, when it comes to *paint adhesion*, more and more industrial concerns are turning to the Turcoat line. The Turcoat booklet lists them all.

Offices in all Principal Cities

TURCO PRODUCTS, INC.
Chemical Processing Compounds
6135 SOUTH CENTRAL AVENUE, LOS ANGELES 1, CALIF.
Factories: Newark, Chicago, Houston, Los Angeles, London, Rotterdam, Sydney, Mexico City, Naha (Okinawa)
Manufactured in Canada by B. W. Deane & Co., Montreal

For more data circle **324** on Reader Service Card

News about UNICHROME Trade Mark

"Automated" chromium bath

Tantalum protects new electric immersion heater

A tantalum sheath encases the heating element in an electric immersion heater developed by Metal & Thermit. This is truly advanced design. It permits direct application of electric heat in all acid solutions except hydrofluoric and fuming sulfuric. It serves as a 5000-watt auxiliary heater . . . is rugged enough for long, continuous primary service.

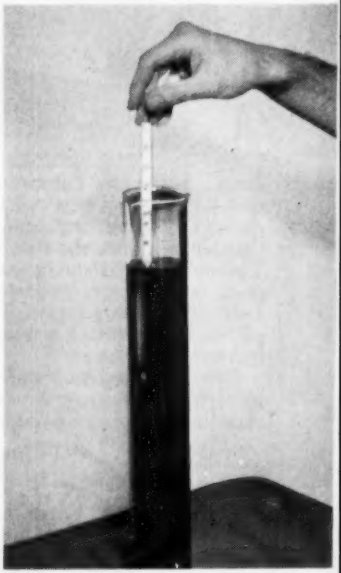
Tantalum is an acid-proof, corrosion-proof metal comparable to steel in strength. It is available in Unichrome U-bend and "hairpin"-bend coils, also. These coils can be used for both heating and cooling, outlast ordinary coils many times over, cutting downtime and costs. Send for more information.

NEW CYLINDRICAL ANODE EXPOSES LARGER EFFECTIVE SURFACE

A new style of Unichrome round anode for chromium plating features a ribbed perimeter. The ribs give 75 current throwing edges or "points" in the 2" diameter anode, and 55 edges in the 1½" anode.

This multipoint ribbed anode prevents trivalent chromium build-up in solutions where cathode area is large. It offers all the advantages of the original smooth round Unichrome Anode. These include longer life, better current distribution, high conductivity, resistance to warping. Send for data sheet RRA-1.

- ***Bath automatically kept in optimum balance***
- ***Chemical control greatly simplified with Unichrome SRHS® Chromium Process***



A simple hydrometer check, taken at periodic intervals, indicates when to add SRHS Compound.

COATINGS for METALS
Metallic . . . . . Organic . . . . . Decorative . . . . . Protective

helps cut plating costs

Remarkable feature of SRHS Solutions is the *self regulation* of important chemical constituents. In effect, this means *automated control.* Automatically kept in optimum balance, the bath assures good results, saves manhours and money.

OPERATION IS EASIER

Unlike plating with ordinary chromium, there's no need to make lengthy analyses of samples of the SRHS solution; no need to lose time determining additions to the bath to restore proper balance for good plating.

Instead, the unique formula of the SRHS compound permits a reserve of chemical to be available in the tank ready to dissolve automatically in the right amount needed to replace losses.

By maintaining themselves continuously in peak plating balance, the SRHS baths provide not only a more foolproof operation, bu also better results.

HOW RESULTS ARE IMPROVED

Through this *automated* control of plating balance, the numerous cost-cutting benefits of SRHS are achieved to the fullest. Plants plate up to twice as fast as with ordinary chromium . . . save on power consumption . . . gain more production capacity without extra equipment . . . and reduce the "burning" and "missing" that account for so many rejects.

Send for Bulletin SRHS-3.

Unichrome is a trademark of Metal & Thermit Corp.

METAL & THERMIT
CORPORATION

General Offices: Rahway, New Jersey
Pittsburgh • Atlanta • Detroit
East Chicago • Los Angeles
In Canada: Metal & Thermit—United Chromium of Canada, Limited, Rexdale, Ont.

For more data circle 325 on Reader Service Card

Using 5 Sly Cabinet Ovens for stress relief of armature shafts, well-known electrical equipment manufacturer experiences uniform oven temperature in closely controlled experimental work.

CLOSE CONTROL OF PROCESSING

with compact, portable SLY OVENS

Sly Cabinet Ovens give accurate temperature control for all laboratory and production baking, drying and dehydrating. Compact, portable, rugged, they are surprisingly inexpensive.

MANY FEATURES: Uniform work chamber temperature assured by use of high-pressure blower — no radiant heat. Double-gasketed doors with effective heat trap. High volume adjustable air flow. High and low heat switch for close control, quick recovery. LEONEL-sheathed lifetime heating elements. And many more.

COMPLETELY ASSEMBLED: Sly Cabinet Ovens are thoroughly tested, then shipped as complete units, including all wiring. Just connect the power lines for immediate operation.

Available in electric (as illustrated) or gas-fired. *Write for Heavy-Duty Cabinet Ovens Bulletin.*

THE W. W. SLY MANUFACTURING CO.

SINCE 1870

4784 TRAIN AVENUE • CLEVELAND 1, OHIO

OFFICES IN PRINCIPAL CITIES

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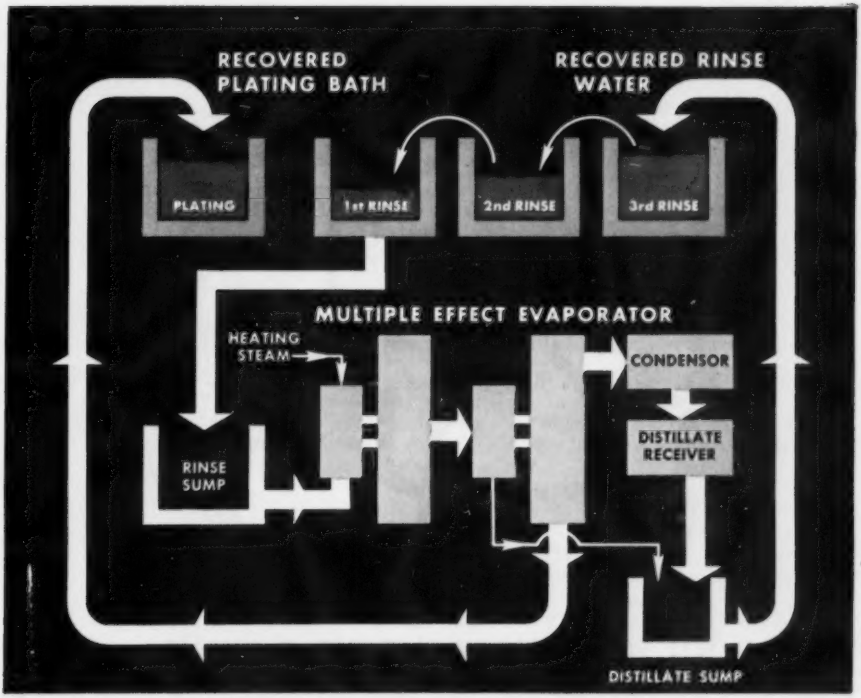

New recovery system cuts plating costs!

Industrial's Plating Bath Recovery Equipment provides complete recovery of acid and metal drag out losses, using a rapid evaporation process engineered to suit your operation. The savings can be fantastic . . . the system not only returns fresh plating solution to the bath and pure water to rinse tanks . . . it eliminates the high cost and trouble of neutralizing corrosive rinse water for disposal. In a typical case the replacement of solution and destruction of rinse water cost $12.46 per hour. **The Industrial System recovers the bath at a cost of $2.13 per hour.**

Unbelievable? . . . No sir! . . . these are systems designed by a company with a 30-year reputation for building the best in plating equipment. Let us prove it—our staff will be glad to make an analysis of your process, recommend equipment and estimate costs and savings.

Send for complete data

INDUSTRIAL

FILTER & PUMP MFG. CO.

5904 Ogden Ave., Chicago 50, Ill.

Please send me reprints of articles and literature on Industrial's Plating Waste Recovery Systems.

NAME_____

TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

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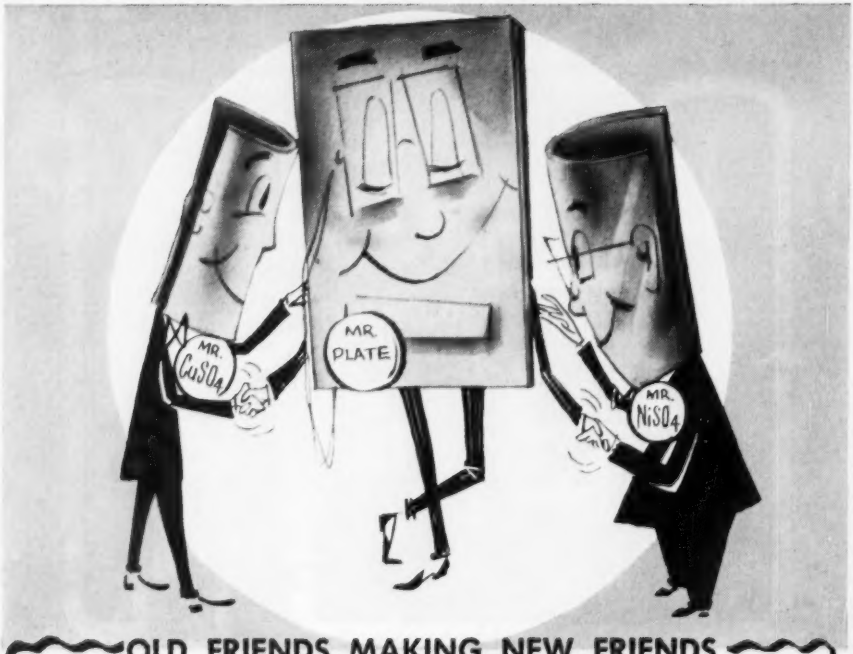

OLD FRIENDS MAKING NEW FRIENDS.

Copper and Nickel have been brought up together in the plating field. They plate, deposit, and alloy together—they are OLD FRIENDS.

TRIANGLE BRAND COPPER SULFATE and TRIANGLE BRAND NICKEL SULFATE as principal sources of copper and nickel in the plating field, are making NEW FRIENDS every day.

The reasons are obvious—purity, solubility, uniformity and high conductivity of their solutions result in QUALITY PLATING.

All-important "extras" found in the use of Triangle Brand Copper and Nickel Sulfates yield long-life plating performance that MAKES THE DIFFERENCE.

Specify: **Triangle Brand Copper Sulfate and Triangle Brand Nickel Sulfate for dependable plating baths.**

PHELPS DODGE REFINING CORPORATION · NICHOLS · TRIANGLE BRAND · CHEMICALS · NEW YORK, N.Y.

PHELPS DODGE REFINING CORP.

300 PARK AVE., NEW YORK 22, N.Y. • 5310 W. 66th STREET, CHICAGO 38, ILL.

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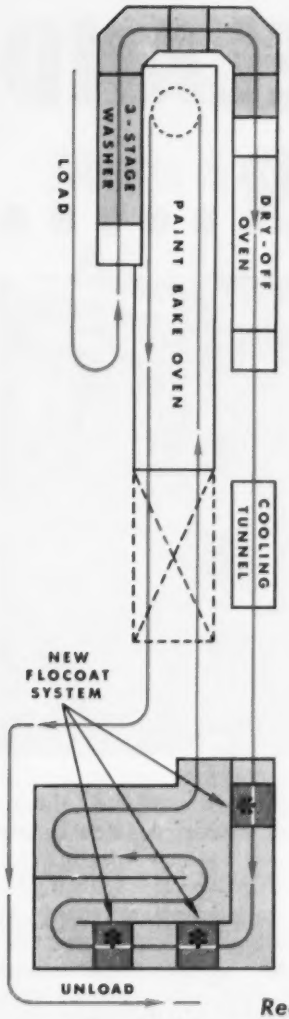

NEW 3 Color Flocoat System with 5 Minute Color Change

This system was specially engineered by Burdett Engineers to provide automation in multi-color paint applications in the plant of the Douglas-Fisher Corporation in Bellwood, Illinois, manufacturers of tubular metal furniture.

This complete finishing system by Burdett features a new concept in Flocoating with a 3-color system that provides color change in approximately five minutes.

This system consists of 750 feet of No. 348 conveyor, variable from 4 to 12 FPM; a 3-stage washer; a 25' dry-off oven heated by Burdett No. 10-L Burners, providing a heat range from 200° to 450° F.; a 15' cooling tunnel; a Burdett 3-color Flocoating System; and a Burdett 2-Pass "A" Type "Radiant Heat" Paint Baking Oven with a range from 200° to 425° F. Operating at 325° F. on current production, the total baking cycle is approximately 8 minutes.

Here is a perfect example of the engineering skill and production "know-how" that Burdett offers you to open the door to improved quality of production — increased output — and lower cost of operating.

Whether you are considering a completely new finishing system—an addition to your present layout—or, the renovating of your old system—consult Burdett for the engineering answer with the bonus values—either "Radiant" or "Convection"

SEE OUR CATALOG IN SWEET'S PLANT ENGINEERING FILE OR WRITE FOR COPY

Request complete information without delay!

BURDETT
MANUFACTURING COMPANY

4916 South Monitor Avenue • Chicago 38, Illinois
Detroit Philadelphia New York Cleveland Dallas

Manufacturers of
COMPLETE FINISHING SYSTEMS — "RADIANT-HEAT SYSTEMS", OVENS, HEATERS, AIR MAKE-UP UNITS, SPRAY BOOTHS AND WASHERS

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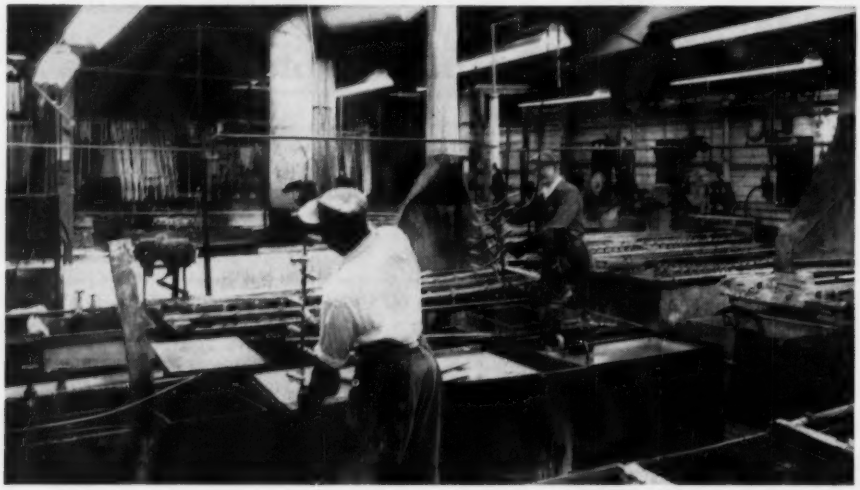
BUSY CLEVELAND JOB PLATER.....



AT this large plating shop, Cowles cleaners (QC, FE, KW, WM, AA and NS) are being used with great success to speed up and improve cleaning operations before plating in these tanks. It has been the experience of this shop (Metal Finishers, Inc.) that one or another of these Cowles cleaners takes care of every job that comes along. And to quote Mr. Ridenour of Metal Finishers, "That's proof of Cowles' reliability, because we get those tough plating and cleaning jobs that many companies won't handle." — For specific information on cleaners for your shop, write Cowles Chemical Company, 7016 Euclid Ave., Cleveland 3, Ohio.

For more data circle **330** on Reader Service Card

Management Abilities for the Engineer

By ROGER M. KYES
Vice President and Group Executive
General Motors Corporation

TO AN INCREASING EXTENT, today's engineer is becoming a manager. This is true at various levels of his work, whether he directs merely his own technical assignment, whether he directs a laboratory group, whether he directs an engineering department, or whether he enters the ranks of general management as many engineers do. But whatever the level, the engineer with management abilities usually gains maximum satisfaction from his performance and makes the greatest contribution to society.

Management always is concerned with problems. Fortunately, the engineer is singularly qualified in this respect for his basic education is designed to develop the ability to solve problems. Yet the art of managing is essentially a social skill. Thus, the engineer—to be a good manager—needs to include in his educational program the development of his own social skills.

Management has changed radically in the last two or three decades. The *boss* of yesterday has been replaced by the *manager* of today. The old-time boss felt secure in his conviction that he knew everything there was to know about his business and anything that could possibly affect it. The physical world around him held little that seemed likely to turn out to be an unknown quantity, either then or in the future. Unlike the boss of years ago, the manager of today does not hold himself aloof from the currents of thought of his time. He is keenly aware of what is happening in the world about him. He has a genuine

". . . his background and training should provide him the capacity —both as a manager and a citizen—to assume leadership responsibility in maintaining and strengthening our free society."

interest in people. He communicates effectively with people. He is sensitive to public attitudes. He understands and respects economic principles. In short, management has taken on new and larger dimensions.

Looking ahead, the tasks that await future managers will be more complex than they are even today. Technology is accelerating at a pace never before equaled in the history of America. Horizons in all branches of knowledge are being pushed outward farther and farther. The automotive industry, for example, is certain to move forward to new heights in the years to come because of such factors as increasing population, suburban living, new highways, rising incomes, and a persistent customer demand for product improvement. Advances are coming down the road in other industries too: home building, commercial aviation, electronics, and power generation, to name a few.

The manager of tomorrow has an outstanding opportunity to take part in and contribute to the revolutionary advances that are certain to take place. Fundamentally, his background and training should provide him the capacity—both as a manager and as a citizen — to assume leadership responsibility in maintaining and strengthening our free society. He will need to be a leader of thought, as well as of action. This is, perhaps, the newest and most significant dimension of the management job.

The challenge facing tomorrow's manager is leadership, not only in technical and administrative matters, but, just as importantly, leadership in the areas of human relationships and the development of social and economic patterns of our society. The engineer who desires management abilities can meet this challenge if he plans his education wisely so that he will be equipped to meet these broader demands. The *formal* education of the engineer properly concentrates on studies of the laws of natural science and their application. But the opportunity also is provided in his curriculum to direct him toward the development of the social skills of the manager. More importantly, the young graduate engineer must take it upon himself to continue this development beyond formal education after he joins the industrial world.

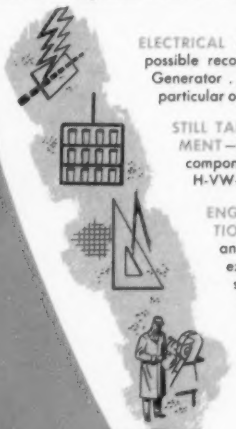
Engineering students now in colleges and universities will spend their careers in a period of unprecedented growth in the nation's economy and technology. They can look forward to increased reward and increased contribution to society if they have developed in themselves the art of managing.

This article was published in the April-May-June, 1957 issue of the "General Motors Engineering Journal," and is reprinted here by permission of that publication and the General Motors Corporation.

For more data on advertisement on opposite page, circle **331** on Reader Service Card ——→

Aluminum
anodizing, buffing and cleaning

No matter what your aluminum finishing problem or need, you'll find the answer at H-VW-M . . . because it is the one company combining a complete engineering service with a complete line of equipment and supplies!



ELECTRICAL EQUIPMENT — Want the best possible recommendation of a Rectifier . . . Generator . . . or Control Equipment for your particular operations? Page 2 tells how to get it.

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ENGINEERING SERVICE AND INSTALLATION — H-VW-M engineers and technicians are anodizing equipment specialists, with years of experience. Page 3 tells why these H-VW-M services mean greater efficiency and savings in your plant.

ALUMINUM FINISHING SUPPLIES — Page 4 shows how H-VW-M research has resulted in new compounds, improved buffs and cleaners to make aluminum finishing easier, better.

HANSON-VAN WINKLE-MUNNING COMPANY

MATAWAN, NEW JERSEY

Manufacturers of a complete line of electroplating and polishing processes, equipment and supplies

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These H-VW-M Anodizing and Finishing ... to New Savings, New Efficiency, New ...

ELECTRICAL EQUIPMENT

H-VW-M is the only manufacturer of both Germanium and Selenium Rectifiers *and* low voltage, direct current Motor Generator Sets for the metal finishing industry. This thorough experience in every phase of low voltage power generation and rectification means that when you bring your power problems to H-VW-M you're sure to get the perfect equipment recommendation.

Self-Contained Rectifier with Tap Switch Control

Remote Controlled Rectifier with Tap Switch Control

Germanium and Selenium Rectifiers . . . Rectifier Controls

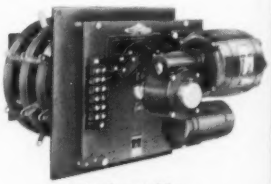
Highest quality and efficiency, flexibility, economy and low maintenance are the characteristics combined in H-VW-M's full line of both Germanium and Selenium Rectifiers. 6 to 48 volt units—both remote and self-contained—provide the exact direct current low-voltage and high amperage required in aluminum anodizing. The widest possible choice of controls and control combinations is available. Such devices as manual or motor operated tap switch controls, continuously variable auto-transformers and saturable core reactors are used with or without supplemental controls to provide automatic voltage stabilization, automatic constant current as well as automatic programming.

Write for Bulletin ER-108, which gives further information about Rectifiers and Controls, plus useful control application suggestions.

Manual Tap Switch Control

Saturable Core Reactor

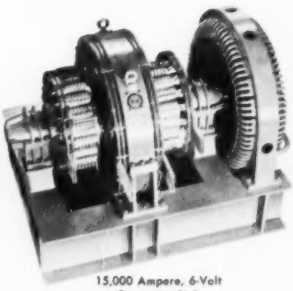
Continuously Variable Auto-Transformer



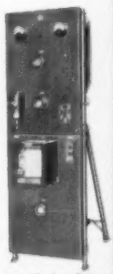
Motor Operated Tap Switch Control

Generators . . . and Controls

H-VW-M Motor Generators designed especially for metal finishing operations are built in sizes up to 50,000 amperes, and accessory equipment includes a full line of controls and control panels to cover any desired control function. Easy-to-maintain H-VW-M Motor Generators have exceptionally rugged and practical construction features insuring maximum performance and life. Standard voltage ratings range from 6 to 50 volts, and include the 18 and 24 volt units usually required for sulphuric acid anodizing, plus the 40 and 50 volt units used in chromic acid anodizing. Write today for 24-page Bulletin G-104, covering in detail all H-VW-M Generators.



15,000 Ampere, 6-Volt Generator Unit

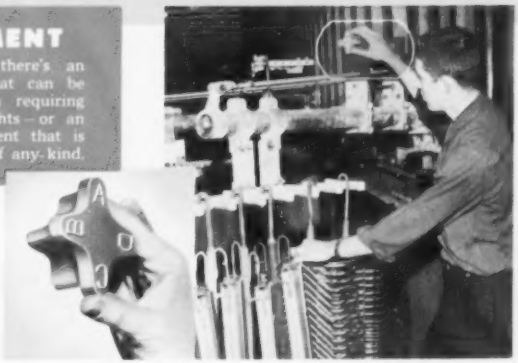


Automatic Anodizing Control Panel

Supplies, Equipment and Services Add Up Simplicity of Operation in Your Plant

PROCESSING EQUIPMENT

Whatever your anodizing procedure, there's an H-VW-M Full Automatic Conveyor that can be adapted to any production application requiring automatic cycling of individual treatments—or an H-VW-M Tank with accessory equipment that is perfectly adapted to still tank methods of any kind.



Workman "dials" desired cycle in refrigerator plant. Parts will by-pass or lower into baths as dial setting dictates.

Automation in Metalfinishing— *Full Automatic Conveyors with Dial-A-Cycle*

H-VW-M's new DIAL-A-CYCLE system automates nine or more complete metalfinishing processes on a single anodizing or electroplating machine. This revolutionary by-pass mechanism can be used on any metalfinishing installation for anodizing, electroplating, or similar processing. It is especially useful and effects substantial cost reductions when a variety of parts requires several different processes or colors.

DIAL-A-CYCLE, as the name implies, is controlled by a simple dial setting. The dial is mounted on the carrier arm that carries the parts through processing tanks. It is set by the machine operator for the processing steps through which each load of unfinished parts is to move. Automatic conveying then takes over, lowering the parts into the required tanks and bypassing others.

Different products, requiring different anodizing cycles, may be processed at the same time, with the same equipment. DIAL-A-CYCLE gives you new versatility while reducing operating, labor, and maintenance costs. Close, automatic control of transfer and immersion periods improves quality.

DIAL-A-CYCLE is the newest of many types of conveyors and equipment H-VW-M supplies to aluminum finishers. H-VW-M also design, manufactures, and installs return-type conveyors . . . elevator conveyors . . . straight-line conveyors . . . and others. For a complete description of all types, write for Bulletin FA-105.

Tanks and Equipment

At H-VW-M—the plating and anodizing industry's workshop—you'll find tank equipment for every phase of your work. For chromic acid anodizing, H-VW-M double electric welded unlined steel tanks are offered, along with steel coil equipment for cooling and heating. The entire system is H-VW-M designed, supplied and installed. For sulphuric acid anodizing, lead-lined steel tanks, plus the necessary cooling coils and air agitation assembly, are supplied. Tanks are fabricated from hot rolled steel, stainless steel, and aluminum. Other types of tanks are also available. Bulletin No. T-108 gives full particulars about this important H-VW-M equipment. Every conceivable type of auxiliary equipment is engineered and supplied, according to customers specifications, including a complete packaged refrigeration system for anodizing solutions.

And H-VW-M's Engineering and Installation Service

Anodizing problems of *any* kind? H-VW-M is prepared to set up your entire anodizing system from beginning to end—a system made up of components scientifically engineered to work together with utmost efficiency. Because of this, and because of H-VW-M's continuing research and development in every aspect of the anodizing picture, you can be confident that the recommendation you receive from H-VW-M is the very *best*.

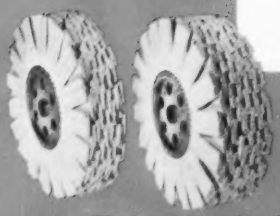
What's more, if requested, H-VW-M sees to it that the equipment you buy is H-VW-M *installed*. This means perfect, efficient operation from the start.

Add to this the fact that an H-VW-M technical representative—ready to serve you—is no further than your telephone. These representatives serve in principal cities across the nation. Get to know the one nearest you. He can help you get the most from your aluminum finishing equipment and supplies.

TURN THE PAGE FOR ALUMINUM BUFFING AND CLEANING SUPPLIES

ALUMINUM BUFFING AND CLEANING SUPPLIES

Since aluminum came into its own after World War II, considerable H-VW-M research and development work has been devoted to the perfection of buffs and compounds suiting the unique physical characteristics of this popular light metal. When long-wearing H-VW-M Buffs are used in conjunction with H-VW-M compounds especially formulated for aluminum finishing, you have the perfectly balanced combination for economy, efficiency and quality performance.

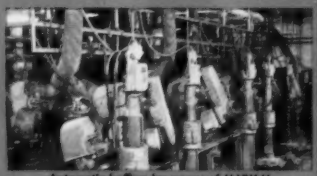


Buffs

Nowhere will you find a wider selection of the buffs you need for preanodizing operations than at H-VW-M. Whether you're looking for a super-heavy-duty buff like new steel-centered Ruff-L-Buffs (which are available untreated, or Binderized® for extra long wear) medium duty buffs like Triplex Buffs, or a buff for medium-to-light service such as the Full Disc Buff, you need look no further than H-VW-M. The full H-VW-M line also includes new Tufts-Flex Buffs (cloth tufts) and Sisal-Flex Buffs (with sisal-centered tufts).

Among this array you'll find the exact buffs for your aluminum finishing needs. Every one is characterized by first quality, uniform new material of close weave and good weight . . . tight sewing with heavy thread . . . and proper balance. Write for 12 page Bulletin B-103, which describes H-VW-M's entire buff line.

Hand buffing using H-VW-M buffs, compounds.



Automatic buffing by means of H-VW-M Liquimatic System.

Compounds

For heavy duty cutting, H-VW-M Liquid Tripoli Compounds 303 and 420 were developed, and are now widely used in the cooking utensil industry. For the appliance, storm window, construction materials and automotive fields, H-VW-M's new Liquimatic Liquid Compound No. 728 has proved especially successful, giving excellent cut, while leaving the surface with deep, high color.

H-VW-M Bar Compounds also find broad use in aluminum finishing. A variety of tripoli bar compounds are offered in varying consistencies to meet all cutting requirements. For cut and color, special white compounds are available. And for high color, several new H-VW-M aluminum oxide compounds—No.'s 6-B-168, 6-B-72 and 8390—give unusually good results. Write for Bulletin CO-103.

Cleaners

H-VW-M devotes constant research to the subject of cleaners in its search for ever better products in the aluminum finishing field.

Matawan Cleaners are designed specifically to give superior results in soak cleaning, power spray operations, oxide removal, and for special aluminum cleaning and etching operations. Of particular interest is H-VW-M's 855 Cleaner, which prevents scale formation, thus keeping coil and tank walls scale free. This unusual aluminum cleaner leaves an extremely bright surface, and, because of its built-in regenerator, makes maximum effective use of caustic in the bath.

In line with its desire to supply the exact cleaner for the job, H-VW-M offers its extensive laboratory facilities where circumstances demand a special cleaner.

When you think of aluminum finishing equipment and supplies—think of H-VW-M first. Buying from one dependable source . . . H-VW-M . . . means one company assumes full responsibility—your guarantee that you're getting the best . . . in products . . . in performance, in *extra* service.

PLATEMANSHIP

Your H-VW-M combination — of the most modern testing and development laboratory — of over 80 years experience in every phase of plating and polishing — of a complete equipment, process and supply line for every need.

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Oronite* ISOPHTHALIC provides harder films, greater durability, better gloss, *at lower cost!*

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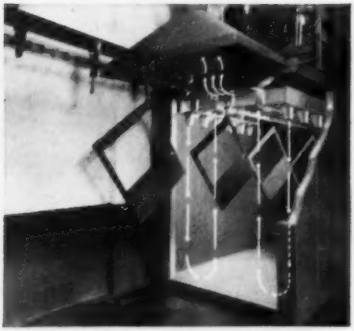
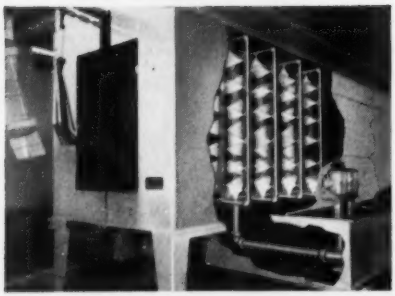
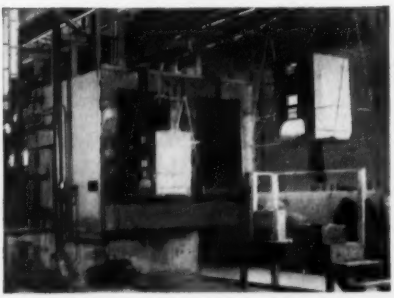
New and expanded line of



NEW! Industrial Ovens



NEW! Parts Washers



NEW! Multi-Stage Metal-Treating Units

Now, through its new subsidiary the Newcomb-Detroit Compan –DeVilbiss emerges as the only "on source" company that designs, manu factures and installs complete system for all major types of finishin operations.

For large, diversified finishing de partments, this means matched equip ment for fully integrated system with performance guarantee a "on source" responsibility.

For specialized shops or operation it means you can select units of *an* kind or capacity for whatever metho best suits your needs.

So, when planning to build, re vamp, or supplement your finishin department, call DeVilbiss—the on source supplier of all major finishin equipment.

THE DEVILBISS COMPANY, TOLEDO 1, OHI

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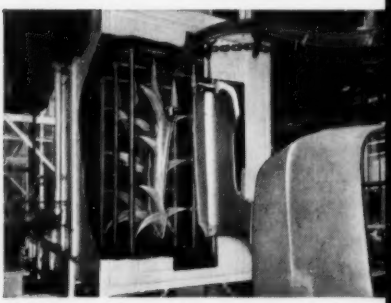
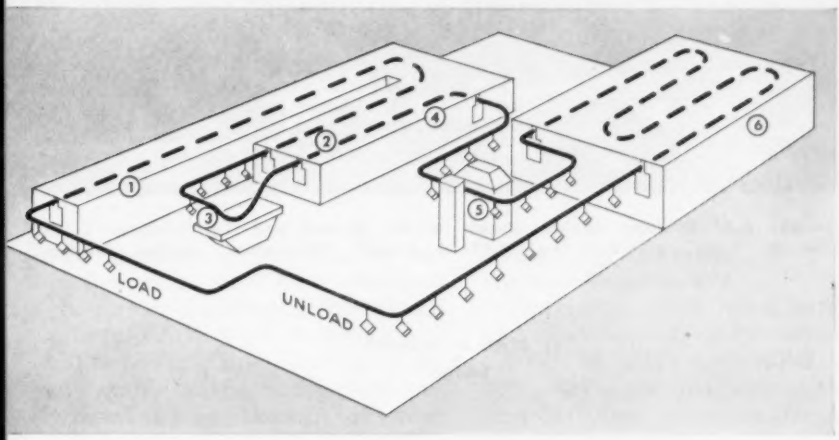


NEW! Flo-Coaters

equipment from DeVilbiss



DeVilbiss' experience in the design, manufacture, and installation of systems like this, means you save in cost and operation; benefit in performance and product quality.

1. Phosphatizing Unit
2. Dry-off Oven
3. Dip Tank
4. Prime Coat Bake Oven
5. Automatic Spray Machine
6. Finish Coat Bake Oven

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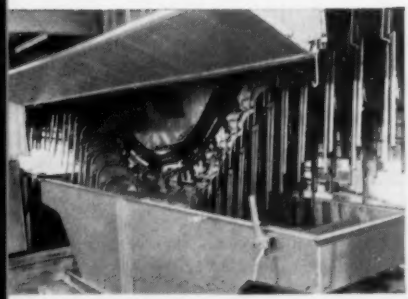
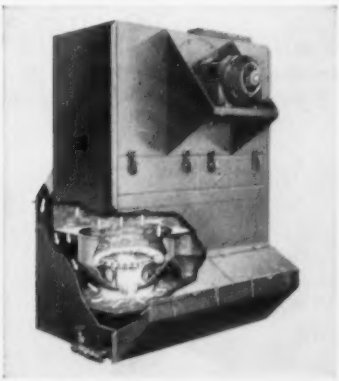
DEVILBISS



NEW! Dip-Coaters



NEW! Dust Collectors

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Finishin

Fig. 1—The B-47 Stratojet bomber (shown on the ground) and the turboprop C-130 transport (in flight) are built by Lockheed Aircraft Corporation, Georgia Division.

By EZRA A. BLOUNT,
Editor

IN THE MARIETTA, GEORGIA, PLANT of Lockheed Aircraft Corporation, Georgia Division, B-47 bombers and C-130 cargo and troop carrier aircraft (Figs. 1, 2, 3) are produced for the United States Air Force. The main production building in the plant is one of the largest aircraft factories in the world, with 76 acres of floor space under one roof. Altogether, the facility has more than 100 acres of floor space, and 100 acres of outdoor aircraft parking areas.

Treatment of the various steel, aluminum and magnesium parts for modern aircraft requires that the finishing department be flexible enough to apply the many finishes specified, and efficiently planned

Fig. 2—Cargo-carrying capacity of C-130 Hercules transport is illustrated at left: gasoline tank truck can be driven inside the airplane and hauled to its destination.

Fig. 3—The United States Air Force's new propjet transport, the C-130 Hercules, taxis across an ice-and-snow-covered runway at Eielson Air Force Base, Alaska. (Photos 1, 2, 3, courtesy Lockheed Aircraft Corp.)

Military Aircraft

Finishing processes for aircraft components include electroplating, electrochemical and chemical surface treatments, and various paint coatings. Extensive finishing facilities are required, because of part size, large number of finishes specified, and production rates demanded.

and operated so that desired production rates may be maintained. The chemical surface treatment area is approximately 70 feet wide and 150 feet long. Three overhead tramrail cranes carry huge racks and baskets of ware through the processing tanks, which are either 40 or 50 feet long, of different widths, and 7 feet deep.

Tanks are fitted with down-draft exhausts. Gratings sunk in the floor cover the area around the tanks. The entire building is air conditioned. Tanks are fitted with automatic temperature controls, and either automatic or manual controls aid the operators in maintaining optimum processing conditions and producing specification finishes.

Anodizing, Chemical Surface Treatments

The metals which must be finished include various aluminum alloys —7075T-6, 2024T-4, 2024T-3, 5052, 6061, 3003—and magnesium alloys. The principal processes used are chromic acid anodizing, Alodizing*, Chromodizing, and the Dow No. 7 process for magnesium. Extrusions, sheets and machined parts, including 40-foot-long milled out aircraft wing and floor sections are treated as required by the individual part specification.

A preliminary cleaning and inspection process is required prior to

*Registered Trade Name, American Chemical Paint Co.

Fig. 4—Formed aluminum channel parts are shown as they are being lowered into Blakeslee vapor degreaser to be cleaned prior to inspection. Screened cover for the 50-foot-long degreaser lowers inside tank when load is to be degreased. Air cylinder operates heavy, counterweighted cover.

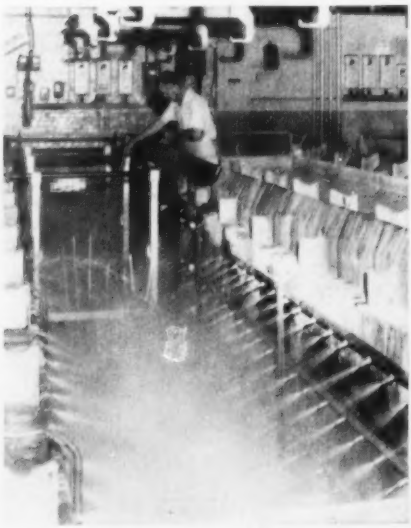


Fig. 5—Basket of parts to be Alodized is suspended in water-spray-rinse tank. Operator uses hose on areas difficult to reach.

anodizing, Alodizing, or other treatment. This cycle is as follows:

1. Load in specially designed racks so that no part being treated touches another part.
2. Degrease in Blakeslee vapor degreaser (Fig. 4). Degreaser is 50 ft. long by 10 ft. deep by 5 ft. wide. Solvent vapor loss is reduced by use of a wire or mesh screen cover. Opening and closing of this screen is facilitated by counterweights.
3. Dip for 40 minutes in Zyglo penetrant.
4. Spray rinse in water.
5. Dip for 5 minutes in Zyglo developer.
6. Hot air dry in pit dryer the same size as the long, deep processing tanks.
7. Inspect for flaws.

Chromic Acid Anodizing

Aluminum stock which passes the inspection just described, and which is scheduled for anodizing, is processed as follows:

1. Water spray rinse.
2. Alkali clean in Wyandotte Altrex cleaner (6-8 oz./gal.) for 10 to 15 minutes at 190 deg. F. pH 10.8 minimum.
3. Water spray rinse.
4. Chromic acid anodize in 3-5 per cent chromic acid, operated for 30 minutes at 95 deg. F. Tank voltage is increased at the rate of 8 volts every 5 minutes until a tank voltage of 40 volts is attained.
5. Water spray rinse.
6. Flowing hot water rinse, 180

deg. F., for 3 to 5 minutes.
7. Hot air dry.

Alodizing Process

Aluminum for which the Alodizing process is specified is taken through the 6-stage preliminary cleaning and inspection process and then treated as follows:

1. Water spray rinse.
2. Clean in Wyandotte Altrex cleaner for 10-15 minutes at 190 deg. F.
3. Water spray rinse. (Fig. 5)
4. Etch in a solution of 6-8 per cent nitric acid containing 3 oz./gal. Deoxylite for 10 minutes maximum. Room temperature.
5. Water spray rinse.
6. Dip in Alodine 1200 (1-3 oz./gal.) for 3 to 5 minutes. pH 1.5-2.0. Room temperature.
7. Cold water dip rinse.
8. Dip in Alodine 1000 (3 oz./gal.) for 30 seconds. pH 4.5. Temperature 140 to 160 deg. Fahrenheit.
9. Hot air dry. (Fig. 6)

Chromodizing Process

A somewhat similar process to that just described is specified for some parts—usually aluminum clad parts. Following the usual preliminary cleaning and inspection, the parts are processed as follows:

1. Water spray rinse.
2. Clean in Wyandotte Altrex cleaner for 10-15 minutes at 190 deg. F.
3. Water spray rinse.
4. Etch in 6-8 per cent nitric acid, containing 3.0 oz./gal.

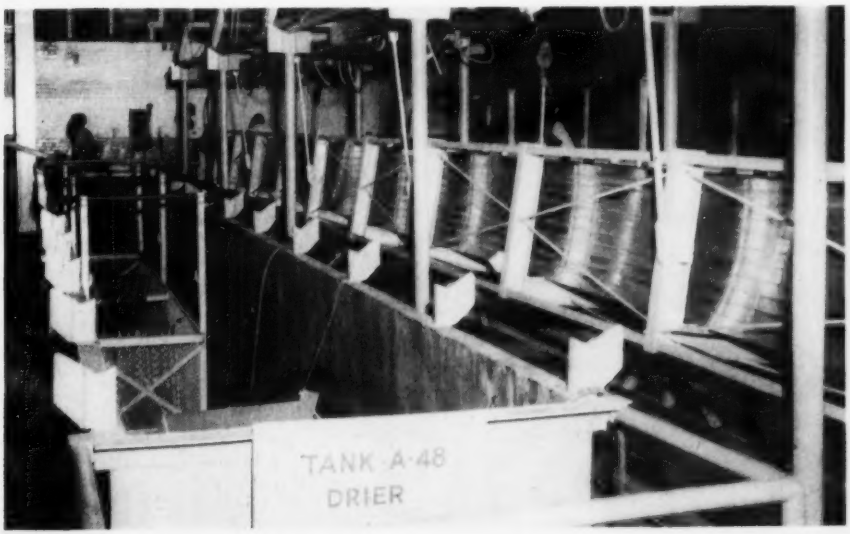


Fig. 6—Hot-air drying tank (center). The 40-foot-long aluminum wing section (right foreground) is racked for anodizing. This section has been milled out from a 1½-inch solid aluminum bar to its present shape. Skin thickness of this section is 0.040 inch.

"Magnesium parts receive the preliminary cleaning and Zyglo inspection required for all metals going into aircraft structures."

Deoxylite, if necessary to remove surface discoloration. Usually, this etching operation can be omitted.

5. Water-dip rinse (if the sulfuric acid etch has been used).
6. Dip for 1½ to 3 minutes in Alodine 1000 (12 oz./100 gal.) at 140 to 160 deg. F.
7. Hot-air dry.

Aluminum parts other than outside skin sections that are Alodized or Chromodized are routed to the paint finishing area.

Dow No. 7 Process

Magnesium parts receive the preliminary cleaning and Zyglo inspection required for all the metals going into aircraft structures. Parts are then racked in phenolic racks, or suspended from stainless steel wire for processing through the Dow No. 7 treatment. The process is as follows:

1. Clean in alkali cleaner for 3-10 minutes. Temperature 190 deg. F.
2. Hot water spray rinse.
3. Hot water dip rinse.
4. Immerse in chromic acid-sodium nitrate solution for 5 minutes.

Fig. 7—One of the two double spray booths in the conveyorized painting and drying installation at Lockheed Aircraft. Other spray booths in the extensive finishing department handle the parts that are too large to be processed through the conveyorized setup.

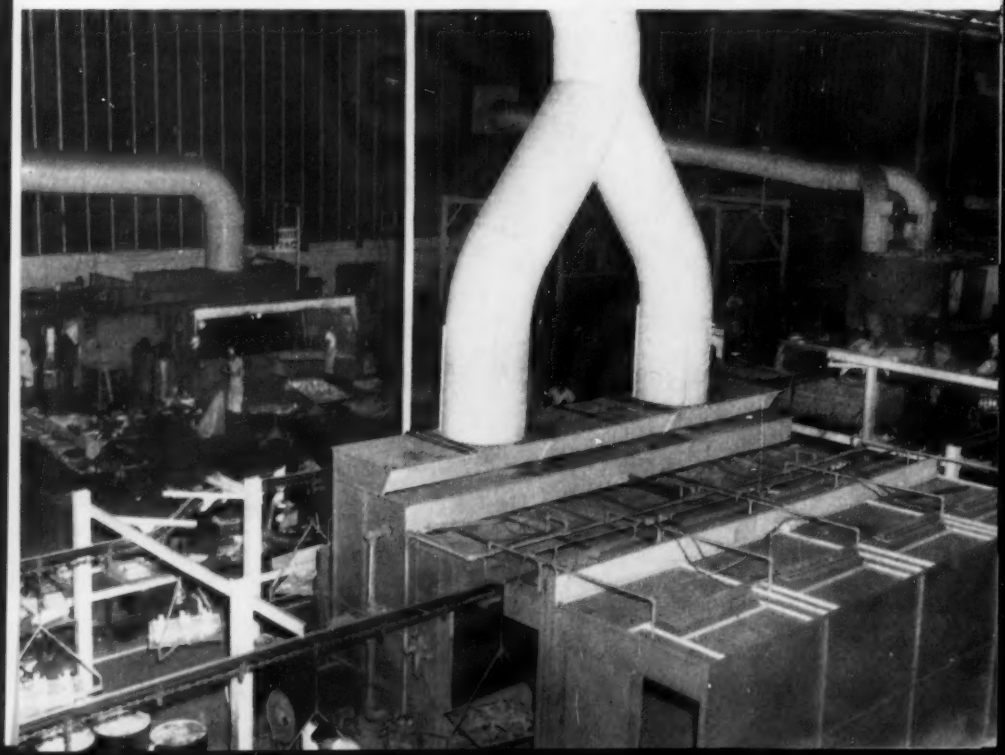
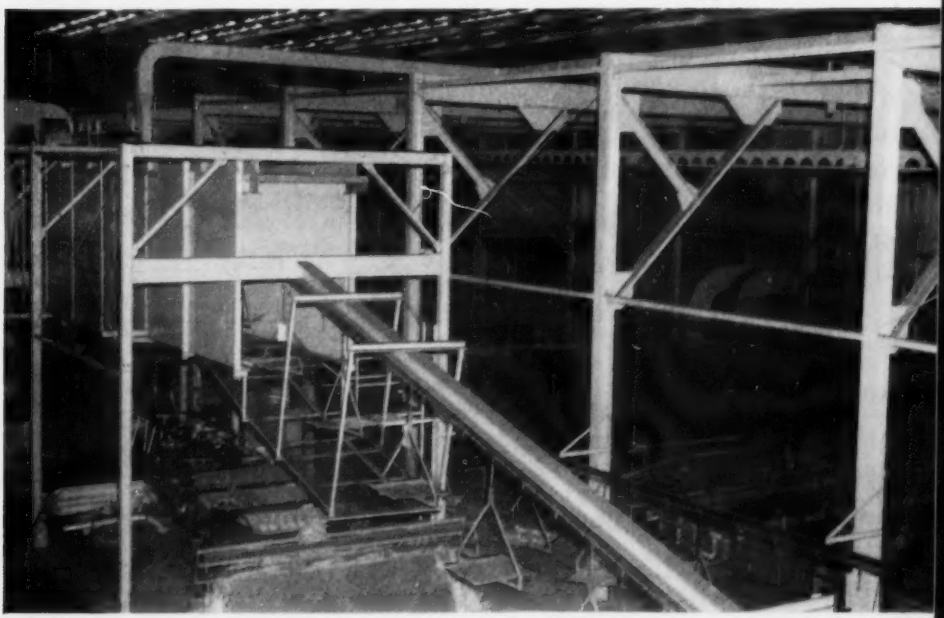


Fig. 8—Interior view of one section of Binks water wash spray booth, showing the method for transporting small parts through the conveyorized spray finishing installation.

5. Rinse in cold running water.
6. Dip in 10-15 per cent hydrofluoric acid for 5 minutes. Room temperature. Tank is lined and fitted with an exhaust system.
7. Cold water rinse for 3 to 5 minutes.
8. Dip in Dow No. 7 solution (16-24 oz./gal. sodium dichromate) for 50 minutes. Temperature boiling. pH 4.2-5.5. Tank is well ventilated. Tank is heated by steam coils on the sides controlled by thermostat on end of tank, near the operator.
9. Cold water rinse.
10. Hot water rinse.

Fig. 9—Sprayed parts move into the overhead Jensen Pan-L-Heat oven (left foreground) for drying. Some of the 50-foot-long chemical and electrochemical processing tanks can be seen in background (Photos 4, 5, 6, 7, 8, 9 by PRODUCTS FINISHING)



"To protect the Alclad surface from abrasion or handling damage until it becomes a part of the completed airplane, a vinyl strippable coating is sprayed over it . . ."

11. Hot air dry.

The treated magnesium parts are now ready to be painted.

Paint Finishing Processes

Magnesium parts, having been treated by the Dow No. 7 process, receive a vinyl primer coat or are sprayed with a zinc chromate primer. Then they are sprayed with a final finish to give added protection to surfaces which will be exposed to atmospheric corrosion in the completed airplane. The aluminum and magnesium parts are suspended from conveyor hangers or placed in trays which are hung on the overhead conveyor. This conveyor connects the two Binks double water wash spray booths (Figs. 7, 8) with an overhead Jensen Pan-L-Heat oven and the loading, unloading, and inspection areas. One material is sprayed on parts in one spray booth; the material sets up in the area between the booths; parts are turned over in the second booth so that another material may be sprayed on the opposite side of the part.

The double booth design makes it possible to spray the same coating, or different coatings, on each side of large skin sections which cannot be turned.

Sprayed parts are carried by the conveyor (traveling at 24 feet per minute) to the overhead Jensen oven (Fig. 9), where the coatings are force dried for five or six minutes at 150 deg. F. Conveyor speed can be regulated from seven to 27 feet per minute. Temperature regulators in the oven are adjustable for the speed of the conveyor. One switch turns on both the oven and the conveyor. Dried parts return to the plant floor where they are unloaded and inspected before going to the proper final assembly area.

The spray finishing department operates as a job shop in that a shop order showing the finish required is attached to the conveyor hanger. Aluminum parts receive the vinyl primer or zinc chromate primer according to specifications. Alclad skin sections receive a spray coat of zinc chromate primer on one side only. The Alclad surface, chromodized, offers adequate corrosion resistance.

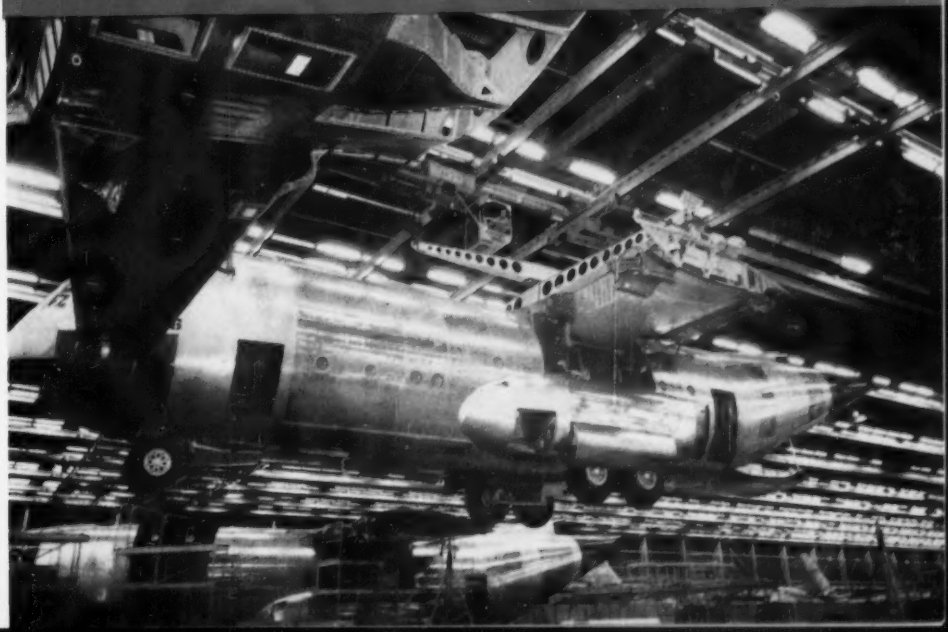
To protect the Alclad surface from abrasion or handling damage until it becomes a part of the completed airplane, a coat of a vinyl strippable coating is sprayed over it in another part of the same spray booth in which the zinc chromate is applied. Large skin sections, which must be sprayed on both sides, are sprayed with one coating in one booth. In the other half of the two-booth set-up the other coating is sprayed on the opposite side of the large skin section.

Lacquer coatings, including gray lacquer, aluminum varnish, aluminum lacquer, and a variety of other finishes are applied according to the various finish specifications.

There are more than 25 different finishes and combinations applied, using pressure pots and paint pumps. Spray booths are coated

Fig. 10—B-47 bombers move down the assembly line. To handle assembly of such a huge airplane, high ceiling and a large floor area not broken up by roof supports are required.

Fig. 11—C-130 transport fuselage assembly is carried by overhead crane to next assembly station. Three assembly lines for C-130's and B-47's are now in operation.



"One entire hanger is really a large spray booth for exterior surface painting of completed airplanes."

with a strippable plastic coating.

In large spray booths fitted with roller conveyors to convey parts through the booth, miscellaneous parts are finished and various special finishes are applied. Among them are acid-resistant paint, abrasion-resistant solid film lubricant. Floor boards for airplanes are spray coated with non-skid flooring material on the wearing or traffic surface.

Magnesium extrusions are zinc chromate primed on one side and coated with an anti-abrasion finish on the other.

Aircraft parts which have been fabricated and treated with the specified surface protective finishes are routed to the assembly departments. Three final assembly lines for the B-47 Stratojet bombers (Fig. 10) and the C-130 Hercules transport planes (Figs. 11 and 12) are currently in operation.

Painting Assembled Airplanes

One entire hanger is really a large spray booth (Fig. 13) for exterior

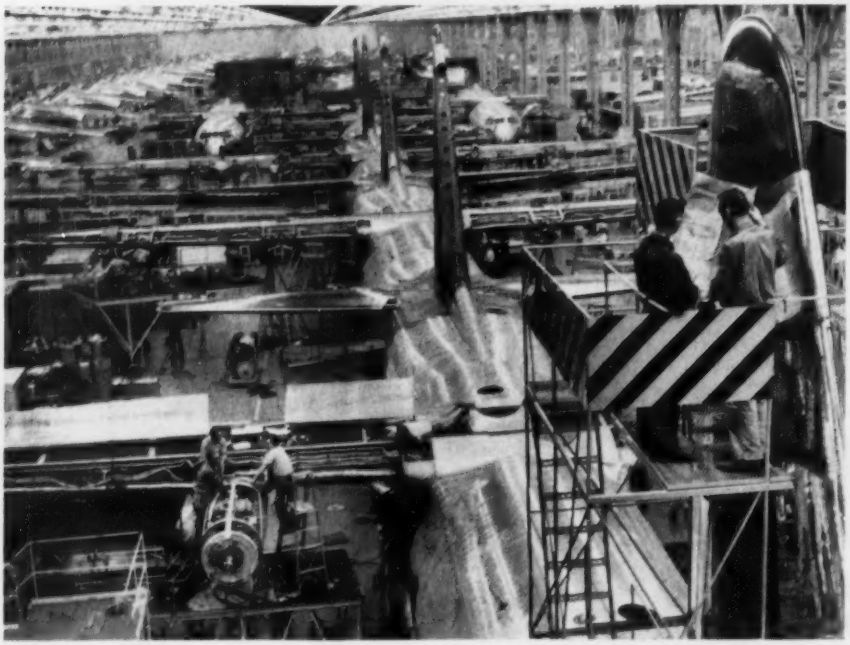


Fig. 12—Final assembly line for the C-130 Hercules transport plane. Final assembly work on towering tail section of this airplane is performed on elevated platforms.

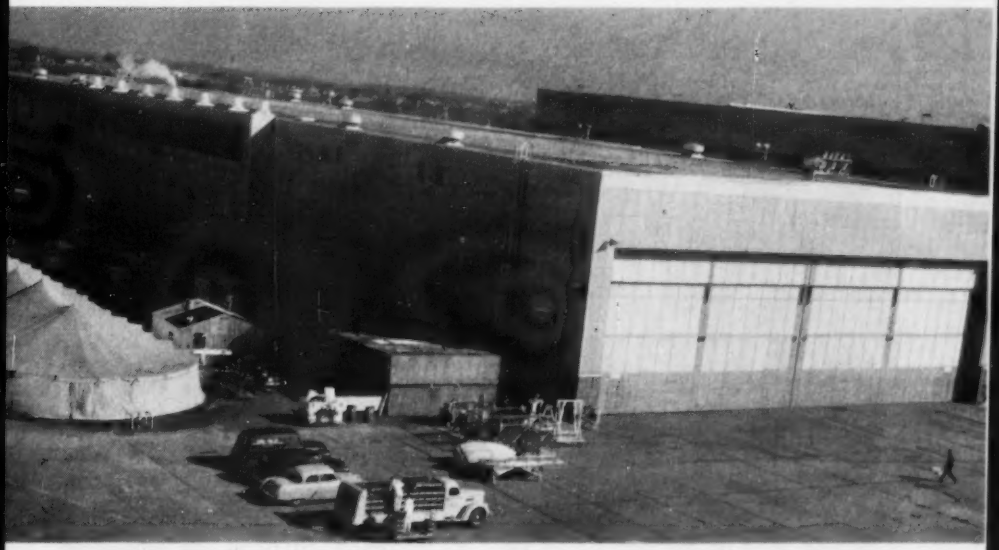


Fig. 13—Masking, spray painting, and stencilling of completed aircraft are performed in this large hanger. Most of the painting is done in the center section. (Photos 10, 11, 12, 13, courtesy Lockheed Aircraft Corporation, Georgia Division, Marietta, Georgia)

surface painting of completed airplanes. The actual spraying area, located in the center section or middle third of the large hanger, is 140 feet by 280 feet by 40 feet high. Air is pumped in through filters along one wall of the hanger and is exhausted through water wash booths on the opposite wall.

Many different finishes are used on the various exterior areas of the B-47. First, the upper portion of the fuselage and wings are masked off so that the lower areas of the fuselage may be sprayed with zinc chromate primer.

This air dries in 30 minutes, and is followed by a coat of Rinshed-Mason white, air-dry enamel, which dries in four hours so that the proper insignia can be stencilled on.

Wing sections receive a spray primer and a finish coat of Corogard No. 14 (Minnesota Mining & Mfg. Co.) for resistance to corrosion and abrasion, and to form a smooth, drag-free surface (Fig. 14). The application of these coatings requires that the other areas of the airplane be masked off. Masking tape and paper are used for masking such large areas.

The surface areas around the cockpit or pilot's enclosure are sprayed with a primer of EC-843-S, then with a finish coat of black Corogard No. 12 (Fig. 14) to cut down the glare, which would decrease the pilot's vision. The Corogard withstands sonic speeds, weather, and extreme temperature changes.

An unusual use of surface finishing methods as an aid to the airplane's pilot is the bright buffing of

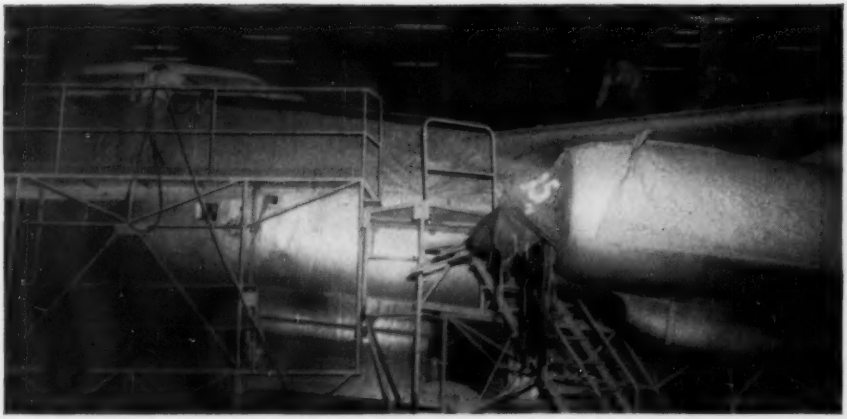


Fig. 14—Spray operators apply Corogard coating to assembled and masked B-47 bomber in center section of the spray finishing hanger. (PRODUCTS FINISHING Staff Photograph.)

a certain area of the side of an engine nacelle so that the pilot can use this area as a mirror to see if the landing wheels are down.

A total of over 960 different stencils and decals are applied to the B-47 airplane. Stencils are employed in spraying insignia and other required markings on the plane exterior. Instructions on the instrument panel of the airplane are applied by silk screen printing.

★ ★ ★ ★ ★

1956 A.S.T.M. Proceedings. The 1510-page volume records accomplishments of the American Society for Testing Materials for the year 1956. It includes technical reports and papers with discussions.

Reports of 80 technical committees with appendices and 52 technical papers with discussions are included in the volume which contains a wealth of material on a variety of subjects. Symposia published separately as Special Technical Publications and all papers published in the A.S.T.M. Bulletin during the year are listed by title and author.

Copies of this book may be obtained from the American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa., at $12.00 each.

Electroplating Baths for Ultra-High-Strength Steels. Part 1—Use of Aliphatic Amino Acids in Cadmium Baths to Reduce Hydrogen Embrittlement. By P. N. Vlannes, S. W. Strauss, and B. F. Brown, Naval Research Laboratory. 15 pages. Price, 50 cents. (Order PB 121836 from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.)

The results of this research indicated that electroplating high-strength steel from an ammoniacal bath containing salts of amino acids results in markedly lower hydrogen embrittlement than plating from the standard cyanide bath. Characteristics of aqueous cadmium baths containing six aliphatic amino acids were studied.

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Training Courses in F

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Education and training in finishing techniques are important to the continued growth of the Finishing Industry. Here's a list of courses available in various cities throughout the country. Many are evening courses, so that people now working in the industry can attend.

COURSES IN ELECTROPLATING

City	School	Instructor	Tuition per Semester	Course Length
Brooklyn, N. Y.	Ft. Greene Evening High School, 29 Fort Greene Pl.	Louis Serota, 4495 Kings Hghy., Brooklyn, N. Y.	None	18 weeks
Chicago, Ill.	Illinois Institute of Technology, 3300 S. Federal	J. M. Andrus, 3701 N. Ravenswood Ave., Chicago, Ill.	$80.00	18 weeks
Cleveland, Ohio	John Hay High School, East 107th St. and Carnegie Ave.	J. L. Jackson J. A. Zehnder	$6.00	12 weeks
Detroit, Mich.	Mumford High School, 17525 Wyoming. Sponsored by Detroit Branch, A.E.S.	John Strandberg	Variable	12 weeks
Indianapolis, Ind.	Purdue University Extension, 902 N. Meridian St.	Dr. A. M. Max, 5640 Guilford Ave., Indianapolis, Ind.	$45.00	16 weeks

COURSES IN ELECTROPLATING (continued)

City	School	Instructor	Tuition per Semester	Course Length
Los Angeles, Calif.	University of California Engineering Extension Division	Mitchell Raskin, 3034 Greenfield Ave., Los Angeles.	$27.00	18 weeks
New Haven, Conn.	New Haven College, 51 Prospect Street.	E. F. Foley, Jr., 442 Elm St., New Haven, Conn.	$50.00	15 weeks
Newark, N. J.	Various Plants and Laboratories. Sponsored by Newark Branch, A.E.S.	R. C. Worthing	$20.00	11 weeks
Philadelphia, Pa.	Temple University, 1808 Buttonwood Street.	Dr. Samuel Heiman, 5155 Westford Rd., Philadelphia, Pa.	$35.00	16 weeks
Providence, R. I.	Central Senior High School, 170 Pond St., Providence, R. I.	Omer Jette, J. Fogarty, J. Castriotta	None	36 weeks
Providence, R. I.	University of Rhode Island Extension School.	Louis I. Kramer, 168 Gallatin St., Providence, R. I.	——	——
South Bend, Ind.	Sponsored by St. Joseph Valley Branch of A.E.S., with classes at Bendix Products Div., South Bend, Ind.	Dr. Harold J. Wiesner, Bendix Products Div., South Bend, Ind.	——	12 weeks

COURSES IN ELECTROPLATING (continued)

City	School	Instructor	Tuition per Semester	Course Length
St. Louis, Mo.	Hadley Technical High School, 3405 Bell Ave.	Dr. Otto C. Klein, American Zinc, Lead & Smelting Co., P. O. Box 495, East St. Louis, Ill.	$9.00	16 weeks per semester, four semesters
San Antonio, Texas	Trinity University	William P. Wisdom, 423 Quentin Dr., San Antonio 1A	$10.00	18 weeks
Stroudsburg, Pa.	Kushner Electroplating School, 115 Broad St., Stroudsburg, Pa. (Correspondence School)	Joseph B. Kushner	$150.00 (Group Discount)	4 mos. to 1 year
Toronto, Ontario, Canada	Central Technical High School	A. R. Moores	$15.00 (non-resident) $5.00 (city resident)	24 weeks

COURSES IN PAINT TECHNOLOGY

City	School	Instructor
Boston, Mass.	Northeastern University, 360 Huntington Ave.	———
Brooklyn, N. Y.	Fort Greene Evening High School, 29 Fort Green Pl.	William Lawrence
Brooklyn, N. Y.	Polytechnic Institute of Brooklyn, 99 Livingston St.	———
Cleveland, Ohio	Case Institute of Technology, University Circle	Dr. E. G. Bobalek, 2309 Lamberton; Dr. W. R. Park, 23580 Lake Shore; Dr. W. von Fischer, 1792 Maywood

COURSES IN PAINT TECHNOLOGY (continued)

City	School	Instructor
Fargo, North Dakota	North Dakota Agricultural College, Dept. of Paints, Varnishes and Lacquers	Supervised by Dr. Wouter Bosch
Gainesville, Florida	University of Florida, 401 Engineering and Industries Bldg.	Professor Henry F. Payne and guest speakers
Houston, Texas	University of Houston	John Garrett
Lafayette, Ind.	Purdue University School of Chemical and Metallurgical Engineering	Professor Albright and guest speakers
Los Angeles, Calif.	Los Angeles City College, Evening Division, 855 N. Vermont Ave.	———
Newark, N. J.	Rutgers University, Adult Center, 53 Washington St.	William Lawrence; also lectures by guest experts
Newark, N. J.	Newark College of Engineering, 367 High St.	Supervised by Fredrick W. Bauder, Professor of Chemistry
New York, N. Y.	New York University Division of General Education, 1 Washington Square North	Dr. Myron A. Coler, Elias Singer, Sidney Lauren.
Philadelphia, Pa.	St. Joseph's College, Evening Div., 54th St. and City Line Ave.	Dr. Willard H. Madson
Rolla, Missouri	Missouri School of Mines and Metallurgy	———
San Francisco, Calif.	City College of San Francisco	———

COURSES IN SPRAY PAINTING

City	School	Instructor
Amherst, Ohio	Bede Products Corp., Amherst, Ohio. (Course in Airless Spray Painting)	R. T. Schafer
Chicago, Ill.	Binks Manufacturing Co., School of Spray Painting, 3118-40 Carroll Ave.	William Beacham
Toledo, Ohio	DeVilbiss Company School of Spray Finishing, 300 Phillips Ave.	I. B. Thomas

Painting Chevrolet V-8 Engines

By GERARD H. POLL, JR.
Associate Editor

THE FLINT, MICHIGAN, CHEVROLET V-8 ENGINE PLANT paints engines in several colors as the final step in the long series of manufacturing and assembly operations necessary to produce the famed engine that was first to reach a milestone in automotive engineering — one horsepower per cubic inch of displacement.

The different colors of paint applied serve several purposes: they help to identify the various sizes and types of car and truck engines; they add to the shiny, clean appearance of the completed product; and they help to protect the engine exterior from corrosion.

The overhead valve V-8's are painted after being completely assembled. As they come off the "test stand," where they undergo their final check for proper operation, the oil and water are drained out of the engines and they are suspended from the overhead chain conveyor by special fixtures that attach to each engine's intake manifold where the carburetor will eventually be attached. Rocker-arm covers are then bolted on (Fig. 1), and the conveyor carries them on toward the paint-finishing area.

The first step in the finishing process is to mask openings and such parts as the distributor. Metal spray masks shaped so as to protect the desired areas are attached in the appropriate places (Fig. 2). The masking area is directly in front of the spray booths.

The conveyor carries the engines into the water-wash spray booth, where operators apply the paint as the engines travel through (Fig. 3). The paint used is an air-dry, semi-alkyd type of enamel. Colors used include gray, green and red.

A strong current of air pulls the overspray paint into the water curtain of the spray booth. This step washes the air, removing overspray. The water used for the curtain is continuously recirculated. The paint solids are floated and removed by a flight conveyor mechanism that drops the paint solids into containers. The paint solids are then reclaimed by Chevrolet. Four separate units do this for the long spray booth, which is treated as four separate water-wash booths, even though it is used as one long, continuous booth. The filters for the water are immediately behind the spray booth.

After leaving the spray booth, the engines travel past two long

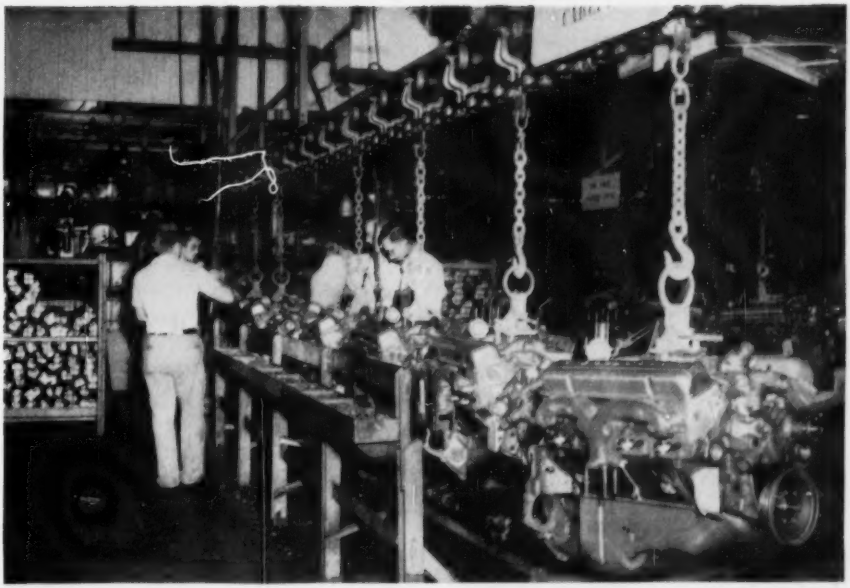
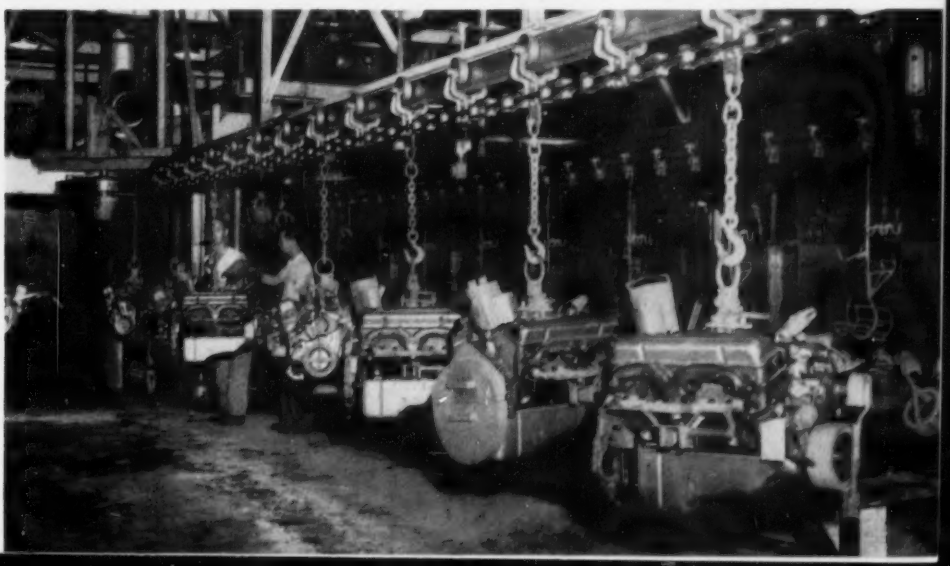


Fig. 1—These Chevrolet V-8 engines have just come off the "test stand" in the far left background. After coming off the test stand, oil and water are drained out of engine and then the men on the left attach rocker arm covers. Engines are then ready to be masked. Note how the engines are attached to the conveyor chain hangers at intake manifold.

Fig. 2—Workers apply metal spray masks in this area. These masks protect the distributor and openings on the engine from paint spray. Conveyor lines in the immediate background are carrying spray masks to and from the stripping machine. The engine spray booth is immediately beyond these conveyor lines, on the right of the photograph.



"One of the problems encountered . . . is that of paint buildup on the conveyor chain . . ."

rows of infra-red lamps that quickly dry the paint (Fig. 4). After the engines leave the baking oven and cool slightly, a painter stencils the word "Chevrolet" onto the raised letters that are stamped into the rocker arm cover. An aluminum lacquer is sprayed through the stencil with a small spray gun (Fig. 4).

Completed engines are removed from the conveyor and placed on stands for shipment to assembly plants.

One of the problems encountered in a high-production, conveyorized installation such as this one is that of paint buildup on the metal masks, fixtures, hooks, and the conveyor chain itself.

This problem is solved in this huge General Motors plant by two machines designed to remove the paint before it builds up and becomes a serious problem. Both are used continuously as part of the painting process.

The first machine is used for removing paint from the metal masks. It is an enclosed, cabinet-type machine, consisting of three sections. The first section contains 2,500 gallons of RAP tank solvent No. 52, a

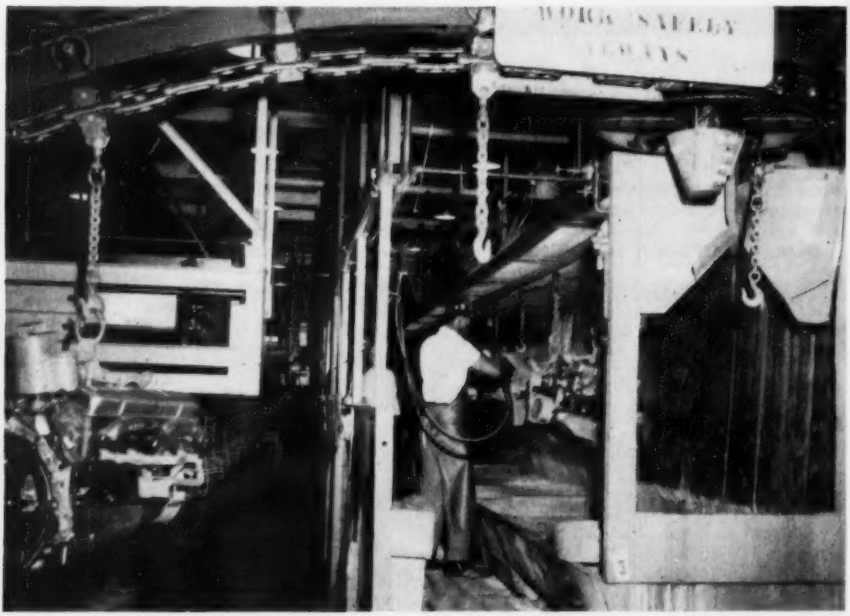


Fig. 3—Engines being spray painted as they travel through the long, water-wash spray booth. Water used is filtered by units to the rear of booth. Engines leave through opposite end of the spray booth, immediately travel to the double-pass baking oven.

Fig. 4—Man in the foreground is stencilling the word "Chevrolet" onto the rocker arm covers after the engines descend from the long infrared baking oven in the right background.

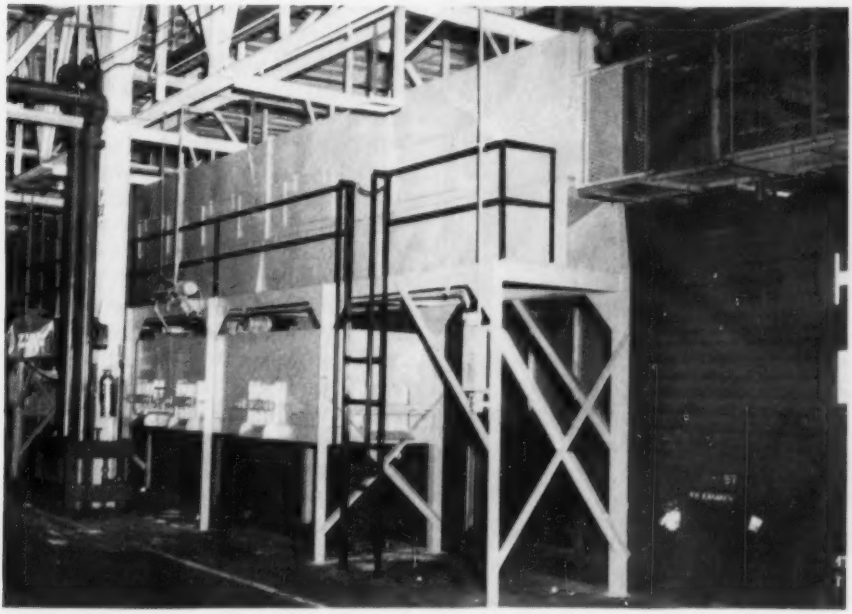


Fig. 5—Stripping unit for removing paint from conveyor chain and hooks is above the main floor level to allow gravity settling of paint solids in the settling tank (below and in front of stripping tank). Chain and hooks enter the unit at upper right.

"These stripping operations prevent buildup of heavy layers of paint . . ."

stripping solvent based on methylene chloride. The masks, hanging on a separate conveyor that travels through this machine, are immersed in this section.

The next section contains a hot, mild alkaline solution. This serves to rinse the parts as well as to heat them; thus it aids in drying the masks. The final section is an air blow-off, wherein the parts are blown dry in preparation for reuse.

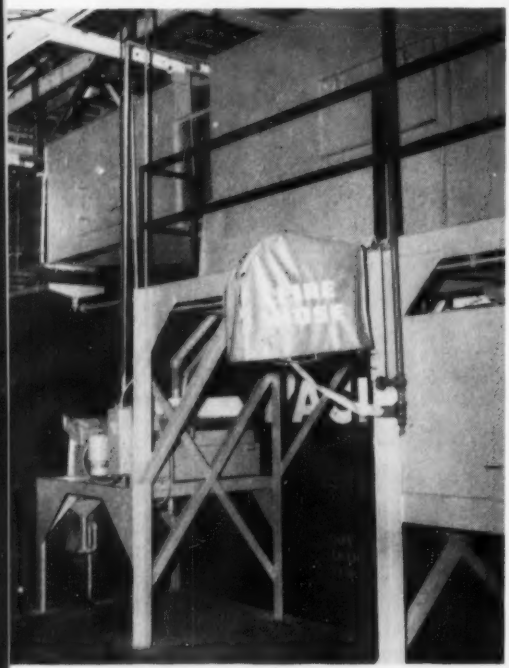


Fig. 6—This filter (lower left) is used to remove paint solids from the water used to spray off the conveyor chain after it has gone through the solvent stripping tank. Water is reused, paint solids reclaimed. (Photographs by PRODUCTS FINISHING.)

This step also serves to cool the metal masks so that they can be removed by hand to be used again. The entire operation is conveyorized.

The conveyor chain and the hooks used to bolt the engines onto the conveyor travel up to another tank, which is above the floor level (Fig. 5). The chain is routed through this 1,000-gallon tank as part of the process; thus it is cleaned continuously.

The machine used for cleaning the conveyor chain and hooks is much larger than the one described previously. It consists of two primary sections: a tank containing RAP Tank Solvent No. 52, and a water-spray rinse section. The chain is immersed in the solvent section for about two minutes as it travels through. It is then blasted with the water spray, which knocks off loose particles of paint. The water from this section is filtered continuously (Fig. 6), removing paint solids for reprocessing and returning the water for reuse.

The solvent used in the first section of the stripping machine is used for about three months before being pumped out into separate tanks, where the solids settle out. After settling, the solvent is decanted off the top of the settling tank and pumped back into the stripping tank.

These stripping operations prevent buildup of heavy layers of paint; therefore they accomplish their purpose: to keep the masks and conveying equipment clean and in efficient operating condition.

A Timely Message on

The Role of the Sales Engineer

by Ben P. Sax

Chairman of the Board, American Buff Company

In the popular mind, a sales engineer, as well as any other salesman, is often thought of as an aggressive, back-slapping, hand-shaking, 3-martini-lunch man with the heart of a playboy. Indeed, many people are just a little envious of this person who seemingly does no work for a high salary. Mainly a myth, this popular conception is an interesting study in the evolution of modern sales methods and techniques.

In the earlier years of the 20th century, sales engineers as we know them were virtually non-existent. Most salesmen in these "good old days" relied strongly, if not entirely, on the force of their personality. Being a "good Joe" did in fact result in getting orders. This is the salesman-image that lurks deep down in the minds of most of us. It's also the basis for the popular misconception that often obscures the vital and totally necessary role played by the sales engineer in today's robust economy.

The impact of product proliferation and specialization on our expanding economy literally created the sales engineer. Wherever you look in industry today, he is serving as a vital link in relating specific products to specific customer needs. The warm handshake is still there of course, but today's engineer who sells is a veritable storehouse of information. He coordinates products to plans in order to help solve particular problems that customers have. As such, the sales engineer is a valued member of the executive team and well worth his compensation.

If *your* problems involve metal finishing, we cordially invite you to call upon a professional-type sales engineer from American Buff. He is eager and able to serve you.

Sincerely,

Ben P. Sax

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What To Do Until the Waste Expert Comes

A step-by-step method of securing data that will aid in designing a waste treatment system . . . hints to minimize the waste treatment problem . . .

By GEORGE E. GLOVER
Industrial Filter & Pump Mfg. Co.
Chicago, Illinois

THERE ARE SEVERAL REASONS for taking preliminary action before calling in a waste treatment engineer (hereinafter called the "expert") when it becomes necessary to begin treating wastes to conform to local, state and federal laws.

First, the expert may not be available immediately, and unless he is a paid consultant, he will not be able to stay long enough to determine all the problems connected with your installation. When he does come, it will save time if you have already secured the data outlined in this article.

Secondly, by following the sequence of determinations and corrective measures outlined here, the most economical solution to the problem may become apparent. At least you may be able to cut down on the size and complexity of the equipment necessary to eliminate the harmful components.

Step I—Legal Waste Limitations

Determine what can be discharged as waste. The limitations must be stated in parts per million of dissolved metals, suspended solids, oil, hexavalent chrome, cyanide; degree of acidity or alkalinity permissible must be known.

The wastes as discharged usually must be within a pH range of about 5-9. Much importance is attached to this limitation, although it is the simplest and the least expensive limitation to meet.

These limitations are set by the state, county, or municipal agency having authority over the body of water or the sewer receiving your wastes. Often, as in the case of a village storm sewer emptying into a state-regulated stream, the village will determine only those limitations that directly affect its sewer piping such as pH and suspended solids. The state will determine the other limitations.

Determination of limitations cannot be done in an afternoon. Two to six weeks are sometimes requir-

ed to obtain a statement of limitations. Occasionally a statement cannot be obtained—that is, the state agency asks that the polluter describe the waste he is discharging, or intends to discharge, and the agency will then give a decision. This is the most difficult situation to deal with without expert advice; if encountered, proceed to Step II and follow the directions closely.

Where the state agency is attempting to require of you the least possible treatment of your waste consistent with its responsibility to the taxpayers down-stream, the agency will state the limitations based on the receiving body—that is, instead of saying how many p.p.m. of chromate your waste may have, they say how many p.p.m. the stream can have after your waste has been introduced. To take full advantage of this sort of limitation, the minimum flow and minimum alkalinity of the receiving body must be known. If this flow information cannot be reliably determined, the stream limitations must be applied directly to your waste without the benefit of any dilution factor. This means that waste treatment equipment will have to be selected and purchased without taking advantage of dilution by stream water. Later information on stream conditions may permit the wastes to be discharged untreated or partially treated at some savings in operating cost.

If you are considering the purchase of waste-generating equipment, the manufacturer of such equipment can logically be expected to define what kind and how much waste will be generated. This information should be submitted to the state and a request made for a decision as to whether this specific waste can be discharged into the sewer or stream you intend to use.

George E. Glover has been associated with water and waste treatment equipment since 1945. He attended Purdue University's School of Engineering. Mr. Glover is a member of the American Water Works Association, The Committee on Underground Disposal of Wastes, The Central States' Sewage and Industrial Waste Association, and the National Association of Practical Refrigerating Engineers. At present he is an engineer for the Water and Waste Treatment Division of Industrial Filter & Pump Mfg. Co., Chicago, Ill.

Step II—Determine the Composition

The composition and rate of flow of the waste must be determined. This determination requires time, as the waste may vary hour by hour during the day—especially at start-up, lunch time and shift changes. Auxiliary operations generate waste that varies from day to day during a month. Typical auxiliary operations in a plating room include dumping spent cleaners and pick-

"Don't try to make even a simple survey in a day."

ling baths as well as general clean-up procedures.

Don't try to make even a simple survey in a day. Don't spend any money on analyses until you have made a rough survey. To do this, select a sample station(s) through which all liquid wastes leave your plant; measure and record: flow rate in g.p.m.; conductivity in whatever units your bridge reads; acidity or alkalinity in any units *except pH*—preferably p.p.m. as $CaCO_3$. Note the appearance of the sample and record the time of day when the sample is taken.

Take a sample three times during every shift, including maintenance shifts and the first idle period following any working shift. Do this for one week.

After establishing the flow composition pattern, take a sample and record the flow rate every working shift and at such times as the rough survey reveals unusual conditions. Analyze the samples for suspended solids, dissolved heavy metals, acidity or alkalinity, cyanides, hexavalent chrome, and pH.

Step III—Compare Waste with Limitations

The composition of wastes as determined from the survey must be compared with the statement of limitations. This has presumably been done and the wastes have been found to exceed the limitations in one or more respects or the waste expert would not be called. Sometimes the survey of the waste discovers nothing toxic or corrosive, but periodic sewage treatment plant upsets, fish-kills and damage to in-plant and municipal sewers are attributed to the waste. In such a case, a more thorough sampling of the waste is required with special reference to week-end flows from the main operation, flows from intermittent operations, and the flow from roof drainage and out-of-plant operations.

Step III (a)—Suspended Solids Reduction

If the total sewer flow exceeds the limitations in regard to the suspended solids, only filtration of total sewer flow is required. The cost of the filter-pump unit (or other solids-liquid separation device) is based on the material of construction required. In the case of the filter, cost is determined by the pounds of solids to be removed per cycle and on the flow rate in g.p.m. of the liquid carrying the solids. Sometimes the total sewer flow is acidic, requiring corrosion-proof filter construction, although the suspended solids seem to originate in a non-acidic component of the total sewer flow. Considerable money can be saved by detouring the acid streams around the filter. This is possible if the acids don't contain too much dissolved metal, since dissolved metals become suspended solids when acid is neutralized.

Step III (b)—pH Correction

If the only violation of the limitations is the pH of the sewer flow, neutralization is required.

If the waste is acidic, the dissolved metals will be precipitated

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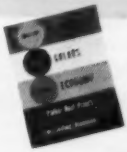

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"If conditions are favorable, ion exchange can concentrate the dissolved metals . . ."

as suspended solids when the waste is neutralized. These suspended solids may exceed limitations. One p.p.m. of dissolved metal will cause 2-3 p.p.m. of suspended solids if neutralization is made with caustic, and 5-6 p.p.m. if lime is used.

The neutralization plant size and cost is determined by its capacity. Batch types (which most states prefer) are sized to contain the total g.p.m. flow for four hours, and are constructed in duplicate to permit continuous operation. For high flow rates, a continuous flow-through system large enough to contain thirty minutes flow is used. The equipment will cost more if the total flow passes through the treatment plant when some components of this flow are neutral and could by-pass the basin.

The operating cost of a neutralization plant is the cost of labor plus the cost of the chemicals purchased for neutralization. Alkaline cleaners and acids should be dumped together, if possible, so that they neutralize each other. Treatment tank sizes of four hours or longer facilitate this scheduling.

The equipment and operating cost of removing the resulting suspended solids is the same as described in Step III (a).

Step III (c)—Dissolved Metal Reduction

If the total sewer flow is found to exceed the limitations only in respect to dissolved metals, and the waste is acidic, then neutralization will precipitate the metals as suspended solids. The amount that is precipitated depends somewhat on the alkali used, as described previously. Where the amount is expected to exceed the suspended solids limitation, filtration or other solids-liquid separation device is required.

In the presence of cyanides, some metals form complex metal-cyanide ions which will not precipitate; therefore, if you have cyanides, you must go back to the state to see if they permit the discharge of complexed metals. If not, you must destroy the cyanides. As these complexing metals tend to interfere with the cyanide destruction reaction, the state will have to accept several p.p.m. of some stable metal-cyanide complexes.

The equipment and operating costs of neutralizing and filtering the total flow are the same as described under pH. If the cyanides and the metals are present in separate components of the total flow, much trouble can be avoided by keeping them separate.

If conditions are favorable, ion exchange can concentrate the dissolved metals so that much smaller neutralization and filtration equipment can be used. In this case, the cyanide problem is avoided.

Step III (d)—Cyanide Concentration Reduction

If the only limitation violated by the total waste flow is the one regarding cyanides, the cyanides must be destroyed. The cyanide-destruction operation produces suspended solids. Occasionally it will cause

To page 66→

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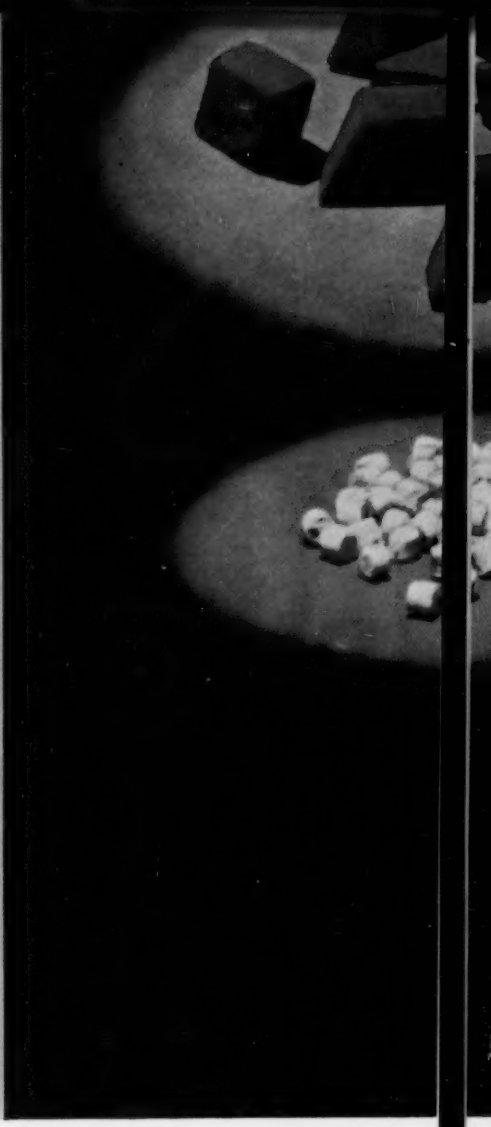

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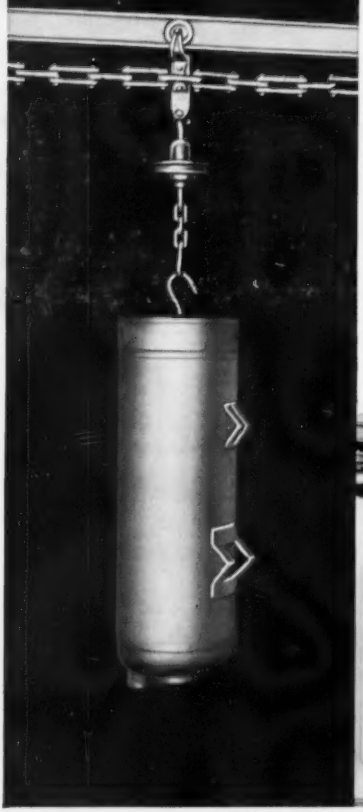

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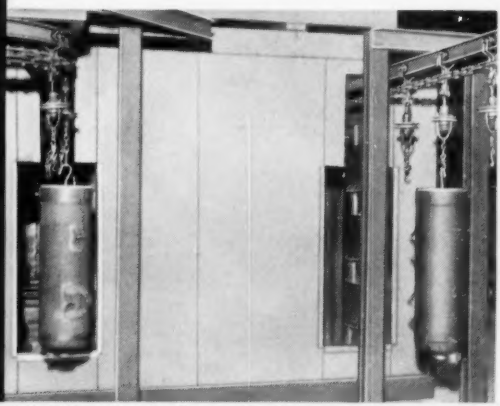

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"The equipment cost of a chromate destruction plant is practically independent of the hexavalent chrome content of the waste."

the destroyed waste to contain suspended solids in excess of the permissible level. The cyanide-destruction equipment may be batch type or continuous. The equipment size and cost is based on the liquid carrying the cyanide. It is practically independent of the cyanide concentration.

The operating costs of cyanide destruction are the costs of the alkali purchased to provide the required alkaline environment, and the cost of the oxidizing agent. The operating costs are based on the pounds of cyanide to be destroyed.

Step III (e)—Hexavalent Chrome Reduction

If the only limitation violated by the combined waste is the one regarding hexavalent chrome, chromate destruction is necessary. The destruction reaction produces dissolved metals, and if the treated waste must have a pH above 6, these metals will appear as suspended solids as in Step III (a). These must be removed.

Briefly, the chromic acid destruction process is as follows: acidify to pH 2; add reducing agents to reduce hexavalent chrome to trivalent chrome; then, if permissible, discharge the acidic but non-toxic waste with dissolved metals to the sewer. If pH and dissolved metal limitations do not permit the discharge of acid and metals, then the pH of the destroyed mixture must be raised, which will precipitate the dissolved metals as suspended solids. These solids will appear as 3-4 p.p.m. suspended solids per p.p.m. of hexavalent chrome destroyed. The solids must be filtered out if they exceed the suspended solids limitation.

There is obviously a distinct operating and equipment cost advantage to discharging the destroyed waste with little or no neutralization performed.

The operating cost is based on the quantity of chemicals required to acidify and reduce the waste; thus addition of some highly acidic non-chrome waste streams is desirable unless they contain so much metal that the reducing agent demand is increased.

The equipment cost of a chromate destruction plant is practically independent of the hexavalent chrome content of the waste. It is based on the volume to be treated. There is then an equipment cost

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penalty for passing non-chromate streams through the chromate destruction plant.

Step III (f)—Single Component Correction in General

So far the corrective procedures have been straightforward. There needn't be any mystery about waste treatment. The destruction, neutralization and filtration equipment and reagents are expensive and the first thing the expert is asked after he has estimated prices is "Do we really have to treat all the wastes?" The answer to this question takes us back to Step II. Now instead of sampling and analyzing the combined wastes from the whole plant, the individual overflows from each tank, fume washer, drip pit and other source of waste must be measured individually for the flow rate and composition.

Previously we determined the flow rate and composition of the combined sewer flow. The combined sewer flow is made up of many continuous streams from individual rinse tanks, drip pits, air washers, and so on, as well as periodic dumps of cleaner and acid tanks. Wastes from one such component stream may be sufficient to cause the entire sewer flow to exceed the limitations set up by the state.

Since treatment equipment cost is based on the flow rate of the water carrying the waste, the treatment of a waste for two conditions can cost more than treating each condition separately. Cyanide and chrome are very expensive to treat unless they are separated.

If the waste generating operation is extensive or variable, the survey must be extended to measure each individual component of the sewer stream.

Step IV—Water Conservation

A survey of individual wastes is a golden opportunity to discover and correct instances of excessive water consumption. Excessive water consumption increases the waste flow volume, equipment size and cost. Water is commonly regarded to be cheap and it is difficult to minimize water consumption unless flow regulating equipment is installed. Such equipment will simplify the survey by holding the flows constant. Fortunately such equipment is inexpensive. It will pay for itself by policing your water conservation.

The simplest way to reduce water consumption is to hold the water flow constant at the minimum rate. To make additional reduction in rinse water consumption, it may be necessary to operate rinses counterflow. Further reduction is possible by adding additional rinse tanks. From known minimum rinse rates on series operation, the reduced rinse flow for counter-current can be reliably predicted. The minimum flow possible with existing tanks should be determined and fixed before proceeding with the survey.

Housekeeping—Drag in Reduction

A close inspection of the water consumption should lead to a close inspection of how water becomes waste. In the plating room valuable solutions are carried from the processing tanks by work being processed. The solution lifted from the processing tank is called "dragout." When these solutions enter a rinse tank both the valuable solution and

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the valuable rinse water become waste. The solution introduced into the rinse water is called "drag-in." Dragout is often determined by the size and shape of the parts being plated. You can expect simple shapes such as a flat plate to drag-out less than a more complicated cup-shaped article. While the designers cannot be influenced by the wishes of the plating room, it is sometimes possible to make minor changes in design which would result in less carryover of solution. It is also possible to rack the objects so as to get better drainage.

Additionally, the amount of dragout becoming dragin can be reduced by the use of fog sprays placed over a tank at the exit point, drip boards or drip tanks for the recovery of concentrated dragout and longer dwell time.

"ALWAYS she boils 'em too long!"

The rinse survey should account for all the water entering the plating room, and should account for all purchased chemicals entering the plating room.

Predicting the Wastes from a New Plant

The manufacturer of the plating machine is the first source of information. Most manufacturers will quote on the waste treatment equipment to handle the wastes generated by their machine. If the plating equipment is to be of your own manufacture or is to be obtained from several manufacturers, the best source of information is the waste treatment equipment manufacturer with experience in the plating field.

Conclusion

It is not my intention to state that waste experts are unavailable —they are as near as your telephone or at least as near as the mailbox. However, their specialty is producing answers to waste problems. The statement of your waste problem is unavoidably yours. If an expert is engaged to survey your plant and prepare specifications for equipment to treat your wastes, it would be your responsibility to make sure that his survey was conducted under representative conditions. The state agencies are reluctant to deal with middle men regarding waste limitations. Your expert will be quick to advise you if some of the limitations set seem unreasonable.

Acknowledgement

The author wishes to acknowledge the invaluable assistance of Ray F. Ledford in the preparation of this paper.

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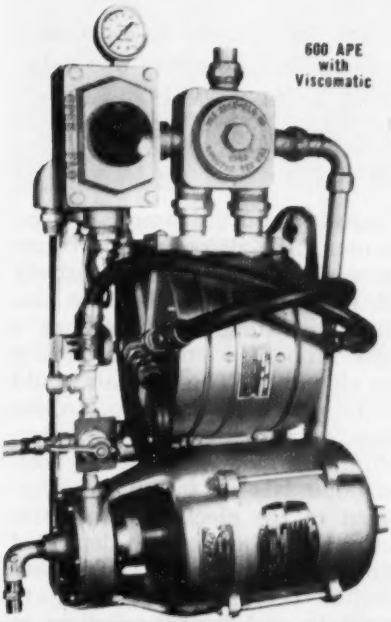

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Page 72

SPOTLIGHTING finishing progress

Electroplating from Organic Solutions

Bureau of Standards electrodeposits certain refractory and light metals or their alloys experimentally from organic solutions . . .

The National Bureau of Standards has succeeded in electrodepositing several of the refractory and light metals or their alloys from organic solutions. The metals deposited include beryllium and alloys of magnesium, titanium, or zirconium with aluminum. The deposits were produced by plating techniques developed in connection with a Bureau program to seek means for electrodepositing metal coatings and electroforming the refractory metals. Except for aluminum, the plating of the refractory and light metals is not yet commercially practicable.

The work was conducted by Jean H. Connor, W. E. Reid, Jr., and Gwendolyn B. Wood, under the direction of Abner Brenner of the Bureau staff and supported by the Wright Air Development Center, Army Ordnance, and the Atomic Energy Commission.

The refractory and light metals have many special properties which make them particularly important to industry and the armed services. Titanium and zirconium are corrosion resistant and have relatively high melting points. They are also light and strong. Titanium has a larger ratio of strength to density than aluminum. These metals would thus be valuable either as protective coatings on other metals or for electroforming. However, their deposition potentials are so far above hydrogen in the electromotive series that none of them can be deposited from aqueous solutions. The Bureau therefore decided to investigate fused salts and organic solutions as baths for electrodepositing the light and refractory metals.

In the present studies, the best deposits of the light and refractory metals were obtained from halides, hydrides, boro-hydrides and organo-

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metallic compounds dissolved in ether. Fused-salt baths yielded the metals only in the form of powder, flakes, or dendrites.

Deposits

As yet, electrodeposits of pure titanium and pure zirconium have not been obtained from organic solutions. However, alloys of these metals with aluminum were deposited from ether solutions containing complex metal compounds. The alloys produced were titanium-aluminum (6 per cent of Ti) and zirconium-aluminum (45 per cent of Zr). Good deposits of magnesium-aluminum (6 per cent of Mg) were also obtained.

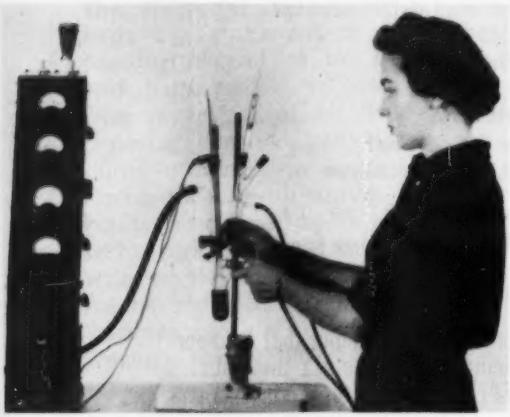

Fig. 1—Set-up for investigating the electrodeposition of a refractory metal from an organic solution at the National Bureau of Standards. A special electrolysis cell contains the plating solution. Argon is passed through the cell via the tube at left to maintain an inert atmosphere. Electrodes are inserted in the solution through the two center tubes. The right arm of the cell is a condenser for reliquefying vaporized organic solutions. Water circulating through the tubes at right cools any vapor, causing it to recondense and fall back into the solution well. Current is controlled by the power supply at left.

Coherent deposits containing 97 per cent beryllium have been produced at the Bureau from an ether solution of beryllium halides and alkyls. A brittle, coherent alloy containing 70 per cent beryllium and 30 per cent boron was obtained from an ether solution of beryllium borohydride. Fine black powders of beryllium have also been produced by electrolysis of ether solutions of beryllium halides or alkyls. Deposits contain 92 per cent beryllium.

Although smooth, coherent deposits of aluminum from hydride baths have been produced at the Bureau for several years, recent improvements have increased bath stability and operating life as well as the thickness of the coatings. Aluminum coatings having good adhesion have been obtained on a number of the common base metals, including copper and steel.

The commercial possibilities of the aluminum bath were demonstrated by a model strip plater designed by the Bureau. A roll of the basis metal in strip form is mounted at one end of the plating apparatus. The metal strip is unwound and led through successive compartments, where it is acid-etched, rinsed, and dried. Then the metal is guided in and out of the plating bath by threading the strip over rollers through two rubber-edged slits placed in the top of a closed glass tank containing the solution. After leaving the plating bath through the second opening, the plated strip is rinsed and dried.

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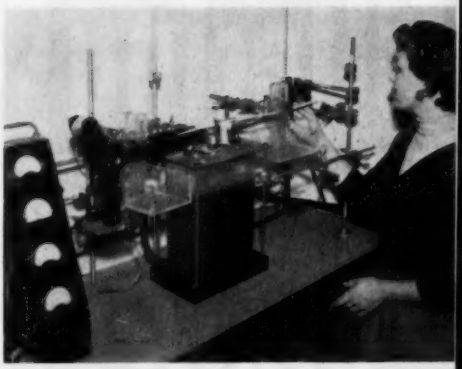

Fig. 3—Model strip plater built by the National Bureau of Standards to demonstrate the commercial possibilities of its aluminum plating bath. A roll of the basis metal in strip form is mounted at the left. The metal strip is drawn through successive compartments where it is etched, rinsed, dried, plated, rinsed again, and dried.

Solvents and Solutes

Before determining the plating ability of any solution, the Bureau obtained qualitative data on the solubilities and conductivities of a number of purified solutes and solvents. For example, different concentrations of lithium aluminum hydride and aluminum chloride in ether were electrolysed at various current densities and temperatures. The data obtained was used in formulating the various plating solutions to be investigated.

Essentially, the organic solvent and the solute containing the metal must be capable of coordination to form a loose or ionizable complex. Not only is it difficult to predict without physical experiment whether or not a given solution will conduct, but most non-aqueous solutions which are good conductors yield no metal on electrolysis.

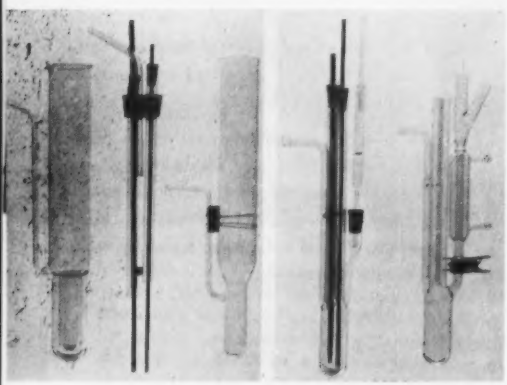

Fig. 2—Special cells and electrodes for electrolysis of nonaqueous solutions. Equipment includes (left to right) dewar cell for use with low boiling liquids, electrodes in glass chimneys, simple cell, cell with mercury seal for escape of excess vapor, and cell with condenser for volatile liquids.

After investigating a number of solvents, the Bureau found that the ethers, particularly ethyl ether, are the most effective solvents for organic plating baths. The more reactive organic liquids, like the alcohols and amines, do not form plating baths with the organometallics and boro-hydrides. Solvents containing a hydroxyl or carbonyl group form too stable a complex with metal derivatives to conduct, whereas the paraffin hydrocarbons and their halogen derivatives usually do not coordinate with the metallic compounds.

Many of the solutes studied were spontaneously flammable and dangerous to work with, thus requiring special handling equipment. Therefore, an inert atmosphere chamber was designed which could be con-

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trolled to be either moisture-free, oxygen-free, or both. Using this equipment, it is possible to filter, distill, transfer, or weigh reactants or products without contamination from water, carbon dioxide, or oxygen. Special electrolysis cells having inert atmospheres were also designed. These cells were used when investigating small quantities (25-50 ml) of the plating solutions which contained the flammable solutes.

In general, the organometallics, borohydrides, hydrides, and halides were found to be the most useful solutes for organic plating baths. A combination of two of these generally produced the best results. How-

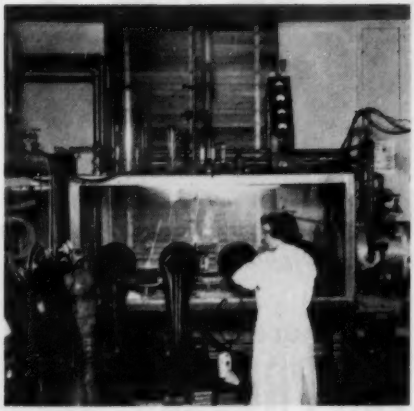
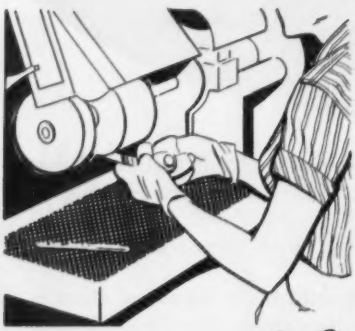


Fig. 4—Inert atmosphere chamber used for handling spontaneously flammable metallic compounds for organic plating baths. Chamber can be made either moisture-free, oxygen-free, or both. Manipulations are performed through the ports to which shoulder-length rubber gloves are cemented. (Photos courtesy National Bureau of Standards.)

PROTECT FINE PLATED SURFACES



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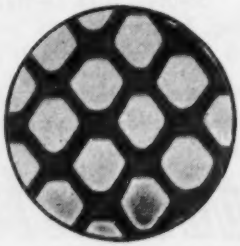

RESEARCH PRODUCTS CORPORATION

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ever, the most effective solute for each element is sharply selective. For example, beryllium dimethyl in ether yielded a fine black beryllium powder on electrolysis, whereas an ether solution of beryllium diphenyl did not even conduct. The borohydrides of beryllium and aluminum in ether yielded coherent metallic deposits, while similar solutions of titanium and zirconium borohydrides did not conduct. The choice of solutes was further limited by the lack of solubility of some metallic compounds in the organic solvents.

An essential part of the Bureau's electrodeposition program has been the preparation of complex metallic compounds (solutes) not commercially available. In some instances, new production methods were developed or improvements made for enlarging the yields. For example, an ether-vapor method for the isolation of beryllium dimethyl, and techniques for the hydrogen reduction of titanium tetrachloride to the trichloride were improved. Special procedures were also developed for preparing titanium borohydride, zirconium aluminum hydride, and a phenyl derivative of zirconium.

It is hoped that the continued development of new compounds, as well as methods for their synthesis and application, will permit electrodeposition of additional refractory and light metals in both pure and alloyed forms.

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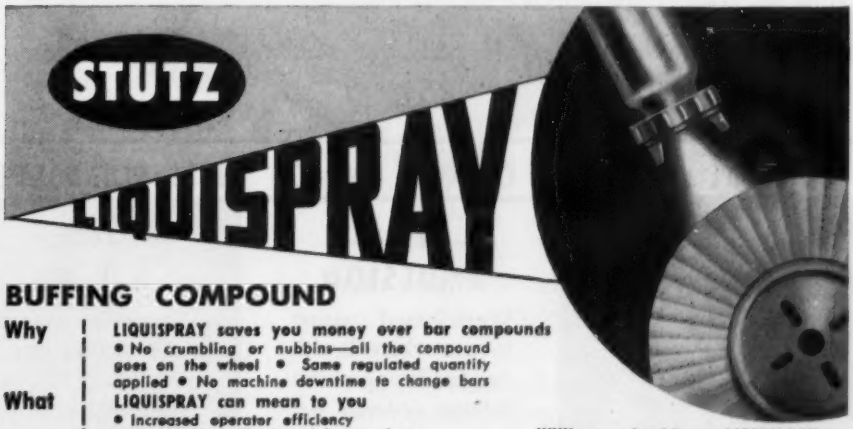

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Special Reports On Finishing Non-Ferrous Metals

NUMBER III—Lustrous, Corrosion-Resistant Finishing with Chemical Polishing Iridite

WHAT IS IRIDITE®

Briefly, Iridite is the tradename for a specialized line of chromate conversion finishes. They are generally applied by dip, some by brush or spray, at or near room temperature, with automatic equipment or manual finishing facilities. During application, a chemical reaction occurs that produces a thin (.00002" max.) gel-like, complex chromate film of a non-porous nature on the surface of the metal. This film is an integral part of the metal itself, thus cannot flake, chip or peel. No special equipment, exhaust systems or specially trained personnel are required.

Chromate conversion coatings are widely accepted throughout industry as an economical means of providing corrosion protection, a good base for paint and decorative finishes for non-ferrous metals. Certain of these coatings also possess chemical polishing abilities that have luster-producing, as well as corrosion-inhibiting, effects on zinc and cadmium plate, zinc die castings and copper alloys. However, continued developments in this field have been so rapid that many manufacturers may not be completely aware of the breadth of application of this type of finish. Hence, this discussion of the many ways in which this chemical polishing characteristic can be used in final finishing or pre-plating treatments to produce a lustrous appearance with distinct display and sales appeal and appreciable savings in cost. Report I on decorative, corrosion-resistant finishes and Report II on paint base, corrosion-resistant finishes are available on request.

The degree of luster possible on a surface is a function of the degree to which the surface can be smoothed. Leveling to provide a smooth surface can be achieved by mechanical or chemical means, or a combination of these, depending upon the luster desired and the original condition of the metal. Chemical polishing effectively imparts luster otherwise difficult and costly to obtain. For this reason, it is often used to supplement or entirely replace mechanical polishing, depending upon the application and the original condition of the metal. Chemical polishing has the additional advantage of providing overall treatment of the submerged part. It reaches into even the deepest corners and recesses that are otherwise inaccessible. Certain of the Iridites are specifically designed to perform this chemical polishing operation. In addition they provide corrosion protection as do all Iridites, thus may be used either as a final finish or a pre-plating polish.

If Iridite is to be used as a final finish, in contrast to pre-plating treatment, the

(ADV.)

chromate conversion coating generated is allowed to remain, providing good corrosion resistance. Color inherent in these Iridite films ranges from a yellow cast to yellow iridescent. These coatings may be used without further treatment where this color is acceptable and good corrosion resistance is desired. Further, these basic coatings can be tinted by dyeing. Among the dye tints available are shades of red, yellow, blue and green. If desirable, the basic coatings can also be modified by a bleach dip leaving a clear bright or blue iridescent finish. In all cases bleaching reduces corrosion resistance.

As examples of this type of final finishing, Iridites #4-73 and #4-75 (Cast-Zinc-Brite) make possible for the first time, lustrous chemical polishing of the as-cast surface of zinc die castings. Thus, in many cases, sizeable savings in finishing cost are realized by elimination of plating costs. This economical method can be used on tools, appliance parts, toy pistols, locks and many other small castings. Another example is the treatment of copper and brass parts, such as welding tips, to eliminate buffing and provide additional corrosion resistance. In many cases, handling costs are reduced appreciably by replacing piece-part handling with bulk processing. Still another example of the use of this chemical polishing and protective quality of Iridite is a simple system of zinc plate, Iridite and clear lacquer instead of more costly electroplated finishes. Typical of this type of lustrous finish are builders hardware and wire goods.

As a pre-plating treatment, in contrast to final finishes, Iridite can be used to chemically polish zinc die castings or copper prior to plating. In such cases, Iridite should be applied as an in-process step, so that the protective film is removed before the plating cycle. The savings in handling, material and labor costs are obvious. This process has made it practical to plate chrome directly over copper on steel, conserving nickel, yet producing a lustrous chrome finish. Used after stripping faulty plate in reprocessing zinc die castings, Iridite restores luster to the casting, making possible replating without blistering.

Other Iridite finishes are available to produce maximum corrosion resistance, a wide variety of decorative finishes and excellent bases for paint on all commercial forms of the more commonly used non-ferrous metals. As a final finish, appearance ranges from clear bright to olive drab and brown and many films can be bleached or dyed. As a paint base Iridite provides excellent initial and retentive paint adhesion and a self-healing property which protects bare metal if exposed by scratching. Iridites have low electrical resistance. Some can be soldered and welded. The Iridite film itself does not affect the dimensional stability of close tolerance parts.

Iridites are widely approved under both Armed Services and industrial specifications because of performance, low cost and savings of materials and equipment.

You can see then, that with the many factors to be considered, selection of the Iridite best suited to your product demands the services of a specialist. That's why Allied maintains a staff of competent Field Engineers—to help you select the Iridite to make your installation most efficient in improving the quality of your product. You'll find your Allied Field Engineer listed under "Plating Supplies" in your classified telephone book. Or, write direct and tell us your problem. Complete literature and data, as well as sample part processing, is available. Allied Research Products, Inc., 4004-06 East Monument Street, Baltimore 5, Maryland.

For more data circle **351** on Reader Service Card (ADV.)

finishing clinic

Suggested solutions to problems submitted by readers. Send your problem to our Editorial Staff. There is no charge.

Stripping Methacrylate Resin Lacquer

Question: *We are extremely anxious to receive help on a disturbing problem of how to strip methacrylate resin lacquer from etched aluminum windows cheaply and quickly.*

Please send us whatever information and references you can on stripping this particular lacquer finish.

In addition, we etch our aluminum products and then de-smut. Where two surfaces are spot welded together we find bleeding of etching solution after lacquering. It is a vexing and costly rework problem to strip the lacquer by hand, rub off the corrosion, clean the corroded spot, and relacquer by hand. We have tried all means possible to flush out, rinse under pressure, or submerge the product to get the etching and de-smut solution out of the parting between the two pieces that are spot welded, but have been unsuccessful.

If you know of any other company who has successfully overcome the problem without redesign, would you please give us this reference.

W. G. S.

Answer: With regard to your request for information on stripping methacrylate resin lacquer, we should like to suggest that you contact the companies whose names and addresses we are forwarding.

Bleeding of etching solutions from spot welded areas is an annoying problem, as you have found. Frankly, it is my thought that the only satisfactory solution to this problem is to re-design your product. However, the same companies to whom we have referred you may be able to offer helpful suggestions that will solve this problem.

Further, we are referring you to a company processing aluminum products in a manner quite similar to that you describe. Possibly they have experienced a problem similar to yours and may be able to help you.

★ ★ ★

We appreciate your aid in referring us to manufacturers of stripping solutions. We have secured two excellent materials.

To solve our problem of preventing etching solutions from "bleeding" we have decided to use a heavy grease between the two spotwelded sections. The grease is applied to one section in a layer about 1/32-inch thick. The two sections are spotwelded together and the excess grease is then removed with Stoddard solution. The grease can also be thinned with solvent prior to applications. When the solvent evaporates, the grease returns to its orig-

inal consistency. Our tests indicate that the use of the grease does not affect the strength of the spotweld. The grease serves as a positive effective barrier to the entrance of any etching solution into the metal layers spotwelded together. We wish to pass along this information which may be helpful in solving similar problems.

W. G. S.

★ ★ ★

Anodizing Aluminum Die Castings

Question: *We would like to know if there is a process for anodizing aluminum die castings. We have some parts which we would like to anodize with a clear finish and some which we would like to finish in jet black.*

We understand that some of the large gun manufacturers make certain parts of aluminum die castings and finish them in a jet black color. These parts, such as trigger guards, have to stand a certain amount of wear.

We will greatly appreciate any information you may give us.

H. B.

Answer: The article "Finishing Systems for Aluminum Die Castings," printed in the March, 1954, issue of PRODUCTS FINISHING contains the comment that oxide coatings (anodized) on die castings do not respond too well to color. Further, the comment is made that for best results in anodizing aluminum alloy die castings, the sulfuric acid process should be used and the coating sealed in potassium dichromate rather than water.

The normal process for anodizing and dyeing with the sulfuric acid process, outlined in the April, 1951, issue of PRODUCTS FINISHING, is as follows:

1. Alkali clean
2. Bright dip (optional)
3. Water rinse
4. Anodize in sulfuric acid for 5-50 minutes at 10 a.s.f. Temperature, 74-78 deg. F.
5. Water rinse
6. Neutralize
7. Immerse in dye solution in stainless steel tank. Temperature 140-160 deg. F.
8. Water rinse
9. Seal in sealing solution.

We are referring you to sources of additional information for anodizing aluminum die castings.

★ ★ ★

Magnesium Chloride in Nickel Tank

Question: *We are interested in the possible use of magnesium chloride as a substitute for nickel chloride in nickel plating baths and strikes.*

Other than roughness from exceeding the limit of solubility at a given pH, will we encounter difficulties from its use?

E. J. M.

Answer: Magnesium chloride and sulfate were ingredients of nickel solutions in use quite a number of years ago. At that time, the magnesium salt was used as an agent for increasing conductivity. As far as I know, it is not used generally in modern nickel plating solutions.

It is difficult, if not impossible, to make a completely positive statement on a matter of this type. The correct thing to do is to make up a number of solutions on a laboratory or pilot plant scale, and conduct experiments which will determine the possibilities or shortcomings of the magnesium chloride.

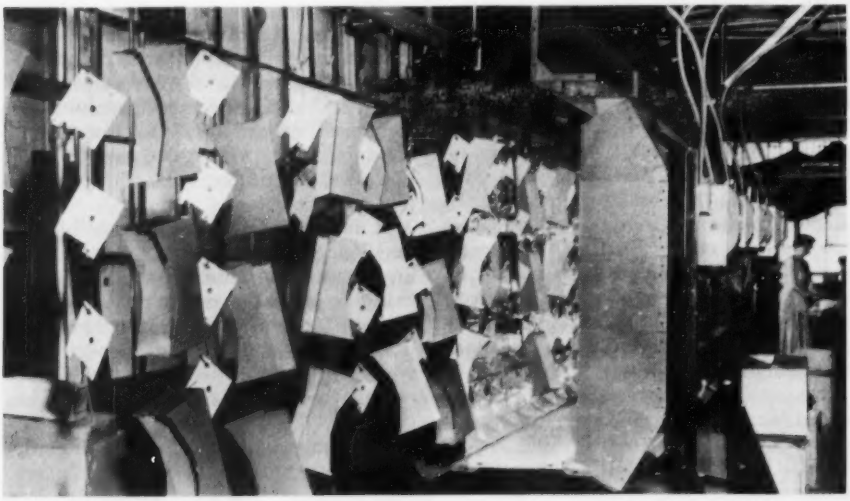
In connection with possible difficulties resulting from the use of magnesium chloride, you may encounter loss of brightness or some pitting in the deposits.

Practical Applications of Modern Products

New Finishing System Sends Parts to Assembly 15 Minutes After Fabrication

Versatile finishing methods enable Automatic Radio Manufacturing Company, Inc., Boston, Mass., to produce finished metal parts almost as fast as they can be sprayed. The 37-year-old firm manufactures electronic equipment, portable, home and automobile radios. The company's improved finishing installation keeps production lines rolling smoothly and facilitates the handling of rush orders involving special models.

One of the big reasons for the system's speed is a modern infrared oven installed by The Fostoria Pressed Steel Corporation, Fostoria, Ohio. It bakes the painted steel cases and other



This Fostoria infrared baking oven is used to bake paint finishes on radio cases and other metal parts. It allows the parts to be assembled only 15 minutes after fabrication.

metal parts and allows them to be sent to the assembly line only 15 minutes after they have been formed.

The company begins the finishing cycle by degreasing all parts. Immediately following degreasing operations, shop trucks transport metal components including steel radio and electronic cases directly to three water-wash spray booths. The metal parts are sprayed with various colors of a hammer finish and then hung on the finishing conveyor, the hangers of which are set on 6-inch centers. "Set-up" takes place during the 5- to 10-minute trip from the spray booths to the 18½-foot-long heating "tunnel" of the Fostoria infrared oven.

Finish baking is accomplished during a 5- to 9-minute cycle in the radiant oven. Temperature in any baking zone can be controlled to produce the baking temperature needed for any series of components.

The oven is 22 feet long, 6½ feet high, and 41 inches wide at the center. Operating load is 75 kw. Baking usually takes place at a temperature of 300 to 375 deg. F., depending on conveyor speed (which is widely variable) and the kind of finish being sprayed.

For more data circle 1 on Reader Service Card

★ ★ ★

Flame-Plated Valve Fights Heat and Abrasion

Parts for jet aircraft are subject to almost incredible extremes of heat and abrasion. Lockheed's F-104A Starfighter, as the fastest and highest-flying fighter of them all, must withstand great extremes in temperature and operating stresses.

Important parts of this aircraft's system are the hot-air valves, which are subjected to high unit loads and temperature extremes.

Lockheed searched and tested many materials and methods which would eliminate galling and provide a low coefficient of expansion over the required service life of the part. Their answer, after many hours of test and

Fig. 1 — Lockheed F-104A Starfighter is equipped with Flame-Plated hot air valves, which can take high stresses and temperatures.

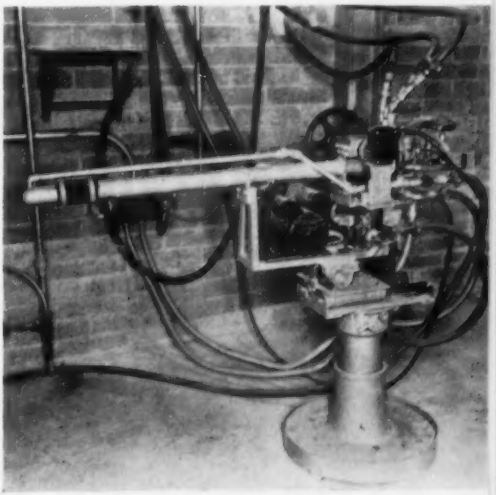


Fig. 2—This "Flame-Plating" gun is used in protecting metal parts against wear.

research: Flame-Plating the bearing surfaces with a coating of tungsten carbide.

The Flame-Plated parts show little wear after being subjected to actual flight testing for the service life of the part. As a result, the process is now part of the regular procedure.

Flame-Plating is a process developed by Linde Company, Division of Union Carbide Corporation.

Here's how it works: particles of tungsten carbide or aluminum oxide are fed into the chamber of a specially constructed gun. The particles are suspended in a mixture of oxygen and acetylene and this mixture is ignited. A detonation wave traveling at 10 times the speed of sound carries the particles through the gun barrel. The gases inside the barrel attain temperatures approaching 6000 deg. F., which heats the tungsten carbide particles to plasticity.

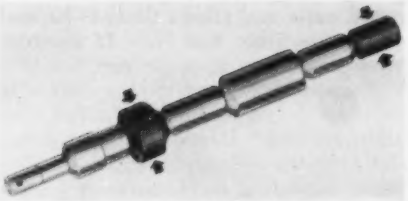


Fig. 3—One of two hot-air valves used in the bleed-air system of the F-104A Lockheed Starfighter. Flame-Plating of the bearing surfaces eliminates galling and assures low coefficient of friction in spite of high unit loading and high temperatures. (Photos courtesy Linde Co., Div. of Union Carbide Corp.)

At supersonic speed, the plastic particles are hurled at the workpiece and embedded by being microscopically welded at the interface. Despite the temperatures inside the gun, the part undergoing plating seldom exceeds

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production pieces faster—better with

Electro-Glo SOLUTIONS

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- ✓ Saves Time—Labor Costs
- ✓ Improves Product Appearance
- ✓ Sold as a Concentrate
- ✓ Used with Standard Plating Equipment

Electro-Glo electropolishing is the modern, economical finishing method in which a fractional amount of metal is removed rather than deposited as in plating. Electro-Glo comes to you as a concentrate, and you purchase the balance of the solution locally. It is used in conventional plating equipment.

Electro-Glo does a multiple job. Deburring, leveling, and polishing take place simultaneously. Any degree of brightness is easily obtained. Electro-Glo concentrates process Copper Alloys, Stainless Steel, Carbon Steel, and less common metals and alloys.

FREE SERVICES

Engineering service available. Sample piece electropolished by the Electro-Glo method without charge. Equipment layout and cost analysis furnished. Special methods and finishes developed. Send for full details.

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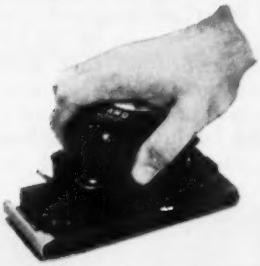
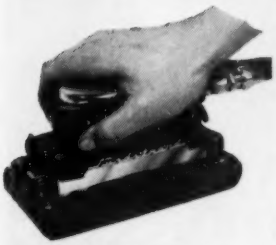
Six sizes of Sundstrand Air Sanders—weighing from 3 to 30 lb—all suitable for wet or dry sanding, give you unmatched freedom of choice. Let us show you advantages of each—without obligation, of course.



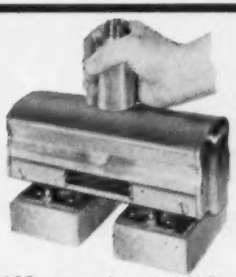
OS-800—lightest weight orbital air sander on the market, at only 3 lb, packs the power and speed needed for production jobs.

OS-700—single-pad orbital sander, weighing 5 lb, operates over 6000 cycles per minute.

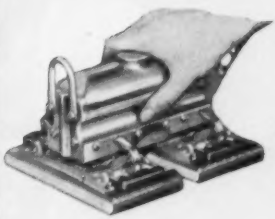
1000—straight-line sander with big abrasive area, operates at 2500 oscillations per minute, palm lever control, 7½ lb.



SP-101—straight-line, single-pad sander, 3000 oscillations per minute, 5 lb.



600—heavy-duty, straight-line unit for sanding, pumice rubbing, or polishing, 1100 oscillations per minute.



4000—straight-line, two-pad sander with longer, slower stroke; 2100 oscillations per minute, 9 lb.

SUNDSTRAND MAGNETIC-PNEUMATIC PRODUCTS

Division of Sundstrand Machine Tool Co. · 1020 Ninth Street, Rockford, Illinois

SUNDSTRAND

A name to remember in **AIR SANDERS**

For more data circle **353** on Reader Service Card

400 deg. F.; thus no metallurgical changes are induced and heat warping cannot take place. By successive detonations, coatings of 0.002 to 0.010 inch can be built up. These coatings can be finished to a smoothness of 1-2 microinches rms.

For more data circle **2** on Reader Service Card

★ ★ ★

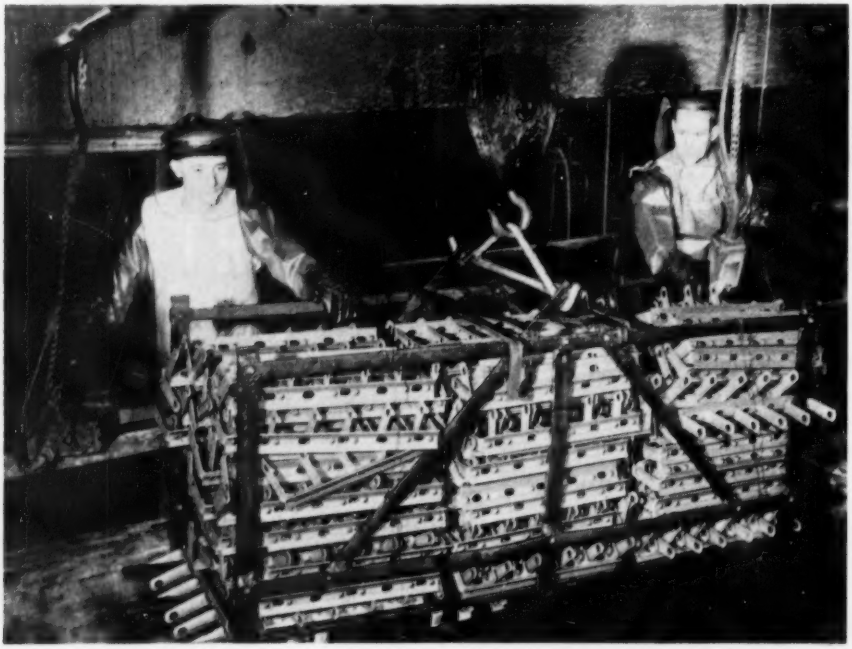
Specialty Stainless Steel Used in Corrosive Pickling Operations

A specialty grade of stainless steel has exhibited excellent service life in 5-15 per cent sulfuric acid pickling baths at temperatures up to 200 deg. Fahrenheit.

The specialty steel, known as Carpenter Stainless No. 20, is used by the Pennsylvania plant of Line Material Co., East Stroudsburg, Pa., for a pickling rack and hangers. These support 1,000- to 2,000-pound loads of pole line hardware during pickling and galvanizing.

The stainless rack, a welded framework measuring 6 feet long by 2 feet wide by 30 inches high, was installed six years ago. The stainless hangers were installed eight years ago. All of these stainless parts remain in use today with every indication that they will render many more years of service in the corrosive operations.

Result of the switch to Stainless No. 20, an analysis developed in



Pickling racks and hangers of special stainless steel are still in service after six to eight years in corrosive solutions. (Photo courtesy Carpenter Steel Company, Reading, Pennsylvania)

For more data on advertisement on opposite page, circle **354** on Reader Service Card

PIONEERING QUALITY INDUSTRIAL FINISHES SINCE 1928

SERVICE–

"Conduct contributing to the advantage of others."

(Webster's New International Dictionary)

CLINTON Service conforms to this definition–

TRY US AND SEE!

Customer Service is Our No. 1 Concern

THE CLINTON COMPANY

1210 ELSTON AVE. • CHICAGO 22, ILL.

wrought form by The Carpenter Steel Company, Reading, Pa., has been maximum safety to employees working at the open acid tank, easier maintenance and uninterrupted production.

Carpenter Stainless No. 20 is a sulfuric-acid-resistant steel. Because the steel has resisted sulfuric so well, the company has adapted it for other parts subject to corrosive action, such as baskets, stirring rods and racks.

For more data circle **3** on Reader Service Card

★ ★ ★

Large Machine Cleans Cast Iron Parts

The cleaning of large cast iron parts, such as painted cast iron lathe beds, is a difficult operation. The majority of these castings are hand cleaned because of their enormous size.

One manufacturer of cast iron parts decided to seek a method of mechanizing this process.

This company's problem involves the cleaning of painted cast-iron lathe beds. The smallest of these is 40 inches long by 24 inches wide by 30 inches high. The largest is 18 feet long by 5 feet wide by 7 feet high. These castings are received from the foundry with gray primer on the outside and a white primer on the interior to protect them from rusting before machining.

The machining operations consist of facing, grinding, drilling and plan-

CLEPCO Quartz Paint Ovens are based on the use of special CLEPCO Quartz Heaters designed to emit that part of the heat spectrum most readily absorbed by paints.

Another major auto manufacturer reports that CLEPCO Paint Ovens are lower in original cost as well as in operating costs than the conventional gas fired convection ovens previously in use.

CLEPCO'S Complete Research Facilities are at your service to determine the most efficient quartz oven for your requirements.

3

SEND FOR COMPLETE INFORMATION

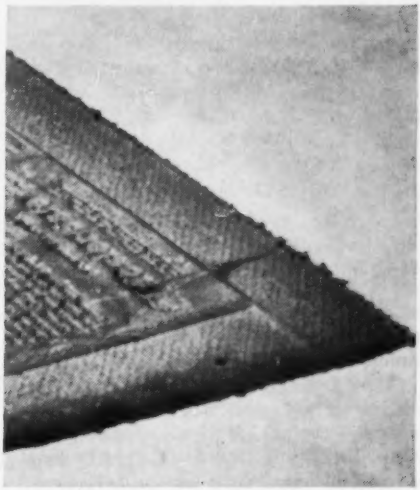
THE CLEVELAND PROCESS COMPANY

1965 EAST 57TH STREET • CLEVELAND 3, OHIO

For more data circle **355** on Reader Service Card

Better work, less waste with "Plus-4" Anodes

TYPICAL TREEING that occurs when using ordinary electrolytic tough pitch copper anodes.



MINIMUM TREEING illustrates one of many savings with "Plus-4" (Phosphorized Copper) Anodes.

The Cincinnati Electrotype Co., of Cincinnati, Ohio, switched to Anaconda "Plus-4" Anodes and now tells its customers on its advertising blotters:

"We use PHOSPHORIZED COPPER because it has . . .

1. Finer, smoother *Grain Structure*. Retains the true value of modern type faces, dot formations of halftone, and tone value of multicolor engravings.
2. Over-all *Uniformity* of shell thickness, longer plate life, reduces replacement costs.
3. Greater *Tensile Strength*, maximum resistance to abrasive and chemical action of colored inks.
4. Sturdy *Backup* for Nickeltypes.
5. Better *Adhesion* for chrome."

From an operating standpoint, Cincinnati Electrotype is also enthusiastic. "Plus-4" Anodes cut waste from treeing (shown above), from solution correction and from sludge. With electrolytic tough pitch copper anodes, they used to clean sludge from tanks 3 times a year. Tanks filled exclusively with "Plus-4" Anodes will run a year or more without cleaning. They also report a time saving of 30% or more in a normal plating cycle when using "Plus-4" Anodes.

It will pay you to see for yourself how Anaconda "Plus-4" (Phosphorized Copper) Anodes can save you time and money—give you better work. Send the coupon today.

67141

"PLUS-4" ANODES

(Phosphorized Copper)

A product of

ANACONDA

Made by The American Brass Company

The American Brass Co., Waterbury 20, Conn.
In Canada: Anaconda American Brass Ltd., New Toronto, Ont.
Give me details on how I can get a test quantity of "Plus-4" Anodes sufficient to supply one tank.

NAME.....

COMPANY.....

ADDRESS.....

CITY.....ZONE....STATE.....

For more data circle 356 on Reader Service Card

ing. These metal-removal processes leave the recesses and cavities filled with chips, grinding dirts, oils, grease, finger prints and other shop dirts.

This company installed a Magnus Aja-Dip Cleaning Machine, a heavy-duty, dip, immersion, agitating machine that is manufactured to handle loads up to 20 tons. It agitates the work up and down through the cleaning solution, causing a scrubbing action that shears the dirts from the metal surfaces, grooves, recesses and holes, leaving them dirt free.

Minutes are now required to do a cleaning job that formerly required hours. Prewashing is eliminated, as is hand scrubbing. Small parts are cleaned at the same time as the large castings are being handled.

For more data circle **4** on Reader Service Card

Hot-Water Heating Proves Economical and Efficient for Heating Tanks

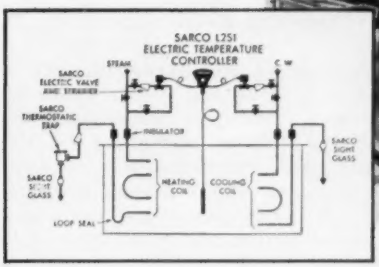
Quality Metal Finishing Company, Lynwood, California, recently built a new plant. Company officials decided at this time that the method they had been using for heating proccessing solutions should be improved. Direct heating over an open gas flame, the method formerly used, was both costly and dangerous.

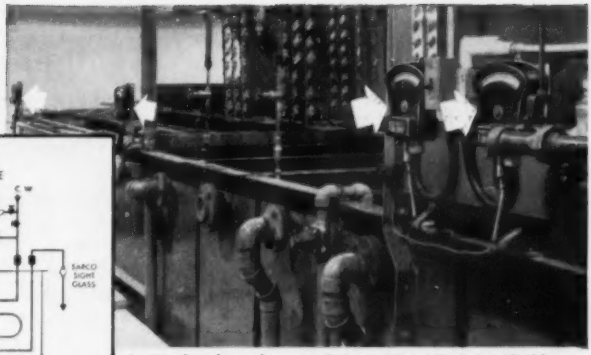
The company asked representatives of the Sid E. Parker Boiler Manufacturing Co. to study the problem and make recommendations.

Parker engineers recommended high-temperature water as the most efficient and economical method for heating the solutions in question. (Quality Metal Finishing specializes

Another fine product made finer . . .
with the PARAMOUNT "Finishing Touch"
"Fine finishes are essential to the sales success of our products," says L. E. Mason Co., leading manufacturer of quality gifts. "To highlight the copper plated and oxidized finish of the coasters, we depend on Paramount Felt Bobs. We get the precise color we want with no 'ragged highlighted ends' and without destroying contrast between the oxidized backgrounds and highlights. Your bobs give good cut, good life while producing the fine finishes we demand."
Wherever fine finishes count, successful firms use Paramount Wheels and Bobs. Join the leaders — specify Paramount. Call your supply house.
Paramount
Felt Wheels, Bobs, Sheet Felt
Bacon Felt Co.
447 West Water St., Taunton, Mass.

For more data circle **357** on Reader Service Card





Seventeen Sarco Electric Temperature Controllers help maintain high quality plating—cut costs—at Ronson Corporation, Delaware Water Gap, Pa. Controllers are used on chrome, nickel, copper, silver, and gold plating tanks. This is a repeat installation.

Improve plating quality—cut your costs with low-cost temperature control

Unstable bath temperatures . . . the result of erratic manual temperature control . . . are sure to lead to costly rejects, wasted man-hours and breakdown of plating solutions.

You can solve these problems at *low cost* . . . by installing always-reliable Sarco Automatic Temperature Control. Just think . . . a complete Sarco System is yours for as little as $130 a tank!

1. **You improve plating quality** because creeping temperatures are a thing of the past.
2. **You lower rejects** because solutions are held automatically to pre-set temperatures. No chance for human error to mess up a tankload . . . and cut into profits.
3. **You get better utilization of time** —platers are able to concentrate on their plating work. No worrying about bath temperatures. No turning on and off of valves.
4. **You save plating solutions** — because automatic control prevents boil-off caused by overshooting temperature.

Write for Bulletin 1025-B or consult your plating supplies jobber. Sarco Company, Inc., Empire State Bldg., New York 1, N.Y.

Sarco LSI Electric Temperature Controller

A COMPLETE SYSTEM FOR AS LITTLE AS $130 A TANK!

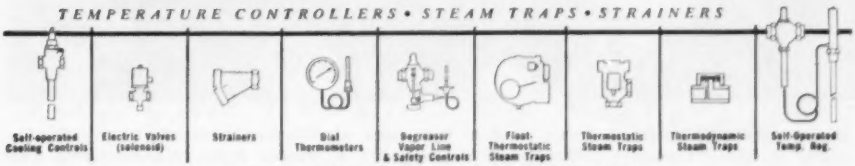
Think of it . . . automatic temperature control that often pays for itself in weeks!

Easy-to-read controller dial clearly indicates temperature being maintained. Temperature setting quickly changed by turning one knob.

2224-B

SARCO *improves product quality and output*

TEMPERATURE CONTROLLERS • STEAM TRAPS • STRAINERS



For more data circle **358** on Reader Service Card

in application of chromate conversion coatings and paint-base prime coatings. The firm also does some cadmium plating as well as color anodizing. In addition, the company maintains a complete paint shop to perform all types of finishing operations.) To do the job, a Parker Model T-4000 Hot Water Boiler with an output capacity of 2,800,000 B.t.u. was installed by the company.

Water heated to a temperature of 290 deg. F. is circulated through heat exchanger coils in the various tanks. Individual thermostats control tank temperatures, so that a number of tanks requiring different temperatures can be operated at the same time.

After eight months of operation, Quality Metal Finishing has found this method of heating to be not only more economical, but more efficient. Boiler operation is almost completely automatic. A watchman pushes a button to start the boiler at 5 A.M. By 7:30 A.M. the plant is in operation —with heated tanks. Down time for inspection and maintenance are at a minimum, the company reports.

For more data circle **5** on Reader Service Card

Filter Fabrics of Synthetic Fibers Aid in Filtration of Corrosive Liquids

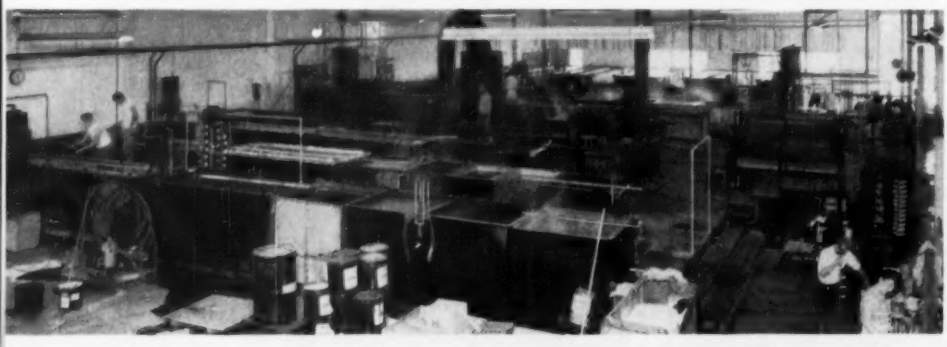
Filtration of corrosive liquids is often a difficult and costly task. An increasing number of companies, however, are taking advantage of the properties of synthetic fibers to solve this problem. Filter fabrics made of such synthetics give longer wear and improved performance in critical applications.

For example: anode bags of DuPont "Teflon" tetrafluoroethylene fiber are used by the Empire Smelting and Refining Company, of Philadelphia, in their electrolytic process of refining precious metals such as gold, silver, and platinum. The bags of "Teflon" are exposed to hot nitric acid.

Twenty-four months ago the company began using bags of DuPont "Teflon." The bags are still giving satisfactory performance.

This application and many others have shown that synthetic fabrics can often be the answer to a problem involving filtration of corrosives.

For more data circle **6** on Reader Service Card



High-temperature water is being used to heat vats of finishing materials at the Quality Metal Finishing Company. (Photograph courtesy Sid E. Parker Boiler Manufacturing Co.)

Leading metal cleaning formulators can tell you —Dow Alkali does make a difference!

The average user of metal cleaning compounds can easily see the difference in performance between a good cleaner and a poor one. However, it's not so easy to detect the difference between two cleaners that give nearly equal cleaning efficiency.

Yet, there often is a difference.

Leading formulators of metal cleaning compounds know that the ingredients they start with make a difference—an important difference in cleaning efficiency. That's why they use Dow Sodium Orthosilicate and Dow Caustic Soda year in and year out. Experience has proved to them that these ingredients deliver the highest alkaline cleaning power they can buy at any price!

Ask your supplier of metal cleaning compounds about the important difference in formulations made with Dow Alkali. THE DOW CHEMICAL COMPANY, Midland, Michigan, Department AL 611L-1.

YOU CAN DEPEND ON DOW

For more data circle **359** on Reader Service Card

Plastisol-Coated Racks Protect Jet Burners from Scratches

Stacking jet burner assemblies on racks coated with a plastisol compound prevents the assemblies from being scratched, thus reducing rejects at Pratt & Whitney Aircraft, Hartford, Conn.

Parts of the assembly are precision machined and polished. The smallest scratch on any surface requires that the entire assembly be scrapped. The resilient plastisol coating protects the parts as they are put on and taken from the racks and while racks are transported from one operation to the next.

The racks are spray coated with a Unichrome plastisol made by Metal & Thermit Corporation. Several coatings build up thickness to 80 mils, pro-

Plastisol-Coated Racks: to prevent scratches

JELCO

• BRASS ADDITIVE

—Also available JELCO COP-BRITE and BARREL NICKEL Brightener

- *Increases efficiency and throwing power*
- *Produces brighter and faster plating*
- *Allows use of higher current density*
- *Eliminates cyanide and ammonia fumes*
- *Retards anode polarization*

Non-Critical Boosts Production Cuts Rejects

Can be used in standard and high speed formulations . . . still and barrel plating

• *Write for complete information*

A Proven Process . . . Used successfully by both manufacturers and job platers

For the "Solution to your Plating Problems" . . . Come to

JELCO FINISHING EQUIPMENT CORP.

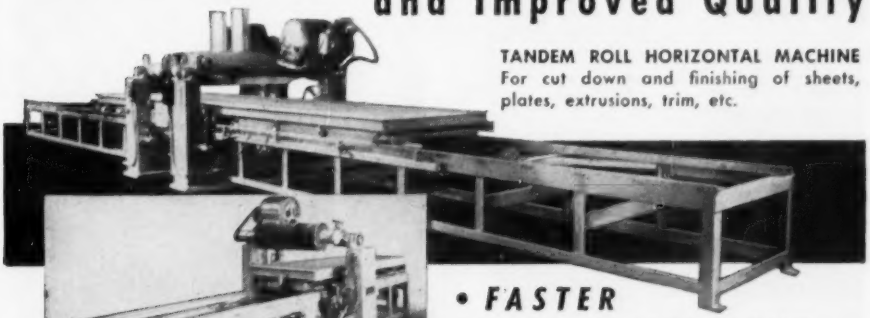
153 EAST 26th STREET • NEW YORK 10, N. Y.

Telephone: LExington 2-3055

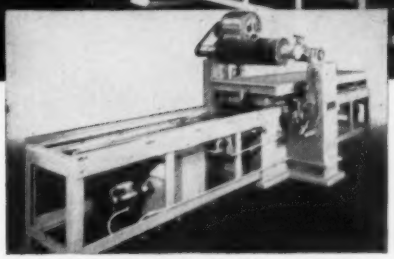
For more data circle 360 on Reader Service Card

CENTRAL Polishing Machines

Pay Big Dividends in Time Saved and Improved Quality



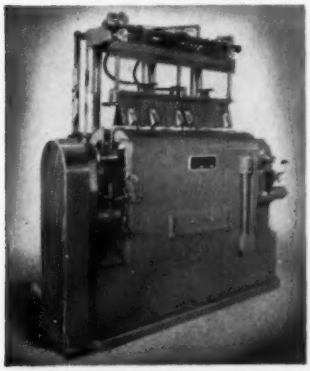
TANDEM ROLL HORIZONTAL MACHINE
For cut down and finishing of sheets, plates, extrusions, trim, etc.



SINGLE ROLL HORIZONTAL MACHINE
Hydraulically operated, with patented hydraulic contour device. Tables on all machines may be oscillated sidewise.

- *FASTER*
- *MORE EFFICIENT*
- *ECONOMICAL*

For cutting costs, improving quality and speeding up your finishing operations on sheets, plates, extrusions, rods, tubing, auto trim and many odd-shaped pieces, Central Polishing Machines will meet every production requirement as they have done so successfully wherever they have been installed.



VERTICAL POLISHING MACHINE
2 sizes, 18" and 36" stroke. Hydraulic contour device. Gives a high finish to many odd-shaped pieces.

Horizontal Machines are built in single and tandem roll models, 30", 40" and 50" widths, in any length. Are hydraulically or electro-hydraulically operated from a central operator's station and equipped with our patented hydraulic contour control. Stroke adjusted from 2" to full capacity in stepless increments. Tandem rolls permit cut down and finishing operations with one set-up.

Vertical Machines are available with 18" or 36" stroke. They are fast, economical and easy to operate. Patented hydraulic contour device permits finishing many different shapes such as hardware items, handles, cutlery, auto and appliance trim, escutcheon plates, etc. Central Vertical Machines may be set in batteries where a sequence of operations is desired. Conveyor systems and fixtures can be furnished.

Write for full information or send us samples of work to be finished.

CENTRAL MACHINE WORKS
74 Commercial St. Tel. PL 6-1500 Worcester 8, Mass.

For more data circle **361** on Reader Service Card

viding protection indefinitely.

Pratt & Whitney also uses Unichrome plastisols for coating tanks in its plating departments. In addition to providing good abrasion resistance, plastisols resist a wide variety of acid and alkaline solutions.

For more data circle **7** on Reader Service Card

★ ★ ★

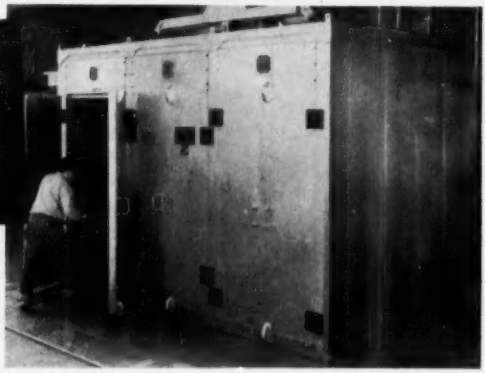
Acid-Resistant Work Clothes Improve Efficiency in Metal Finishing Plant

Danbury Metal Finishing Company, Inc., supplies all workers who come in contact with corrosive plating solutions with with acid-resistant apparel made by Worklon, Inc., New

Acid-resistant work clothes in action: workers at Danbury Metal Finishing Company wear Worklon apparel made of 100-per-cent Orlon while handling sulfuric, muriatic and nitric acids during plating operations. (Photograph courtesy Worklon, Inc., New York, N. Y.)

You're SURE of UNIFORM Drying—FAST

ROCKWELL
Recirculating
OVENS



Uniform distribution of controlled, high velocity, recirculated, heated air assures faster drying or baking at precise temperature.

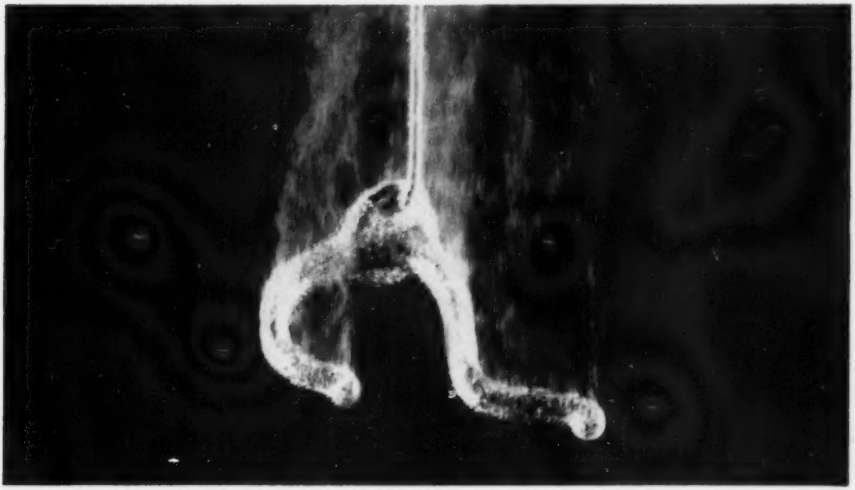
Investigate the oven with the built-in heating "know-how." Write for Catalog.

Made in wide range of standard electric-, gas-, oil- or steam-heated, cabinet, rack or truck types and in special batch or conveyor types.

W. S. ROCKWELL COMPANY 2907 Eliot Street, Fairfield, Conn.

For more data circle **362** on Reader Service Card

REPORT NO. 2/ON LOWERING TODAY'S COST OF PRODUCTION



Improved electrocleaning of recesses and low current density areas

Despite careful racking and well-planned production, deep recesses and places of normally low current density on intricately shaped parts are always trouble spots.

Diversey electrocleaners are specially fortified with exceptionally high wetting and emulsifying powers to do an effective job at those "problem places." This chemical cleaning supplements high current carrying capacities to give more efficient cleaning in a shorter time. Work emerges water-break-free and smut-free, ready for subsequent baths.

Controlled foaming is an added safety feature of Diversey electrocleaning solutions. The limited foam blanket serves as a safeguard against explosion dangers even in those occasional cases where current density is stepped up to speed production. When used according to recommendations, Diversey electrocleaners operate safely through a wide range of current densities . . . always exhibiting a high, stable conductivity.

WRITE TODAY FOR YOUR FREE COPY OF THIS NEW BOOKLET

Metal Industries Div.
The Diversey Corp.
1820 Roscoe St.
Chicago 13, Ill.

PLANTS IN CHICAGO, NEWARK AND SOUTH GATE, CALIFORNIA. WAREHOUSES IN PRINCIPAL CITIES.

DIVERSEY® ELECTROCLEANING

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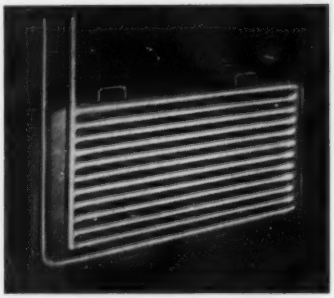
DEAN THERMO-PANEL COIL
TAKES THE PLACE OF
PIPE COILS



WHAT IS YOUR PROBLEM?

PHOSPHATING?
DEGREASING?
PLATING?
CLEANING?
DRYING?

Whatever it is, modern products finishing executives are no longer using old-style pipe coils. They are insisting on the

DEAN®
THERMO-PANEL
COIL

because of its outstanding superiority. The photograph above shows one of our standard types, this one being type AP. Usually costs less than pipe coils. Much lighter. Uses less space. Simpler. More efficient. More economical. No electrical hazards. Easily cleaned. Obtainable in special shapes—U's, L's, J's, and cylinders. Made of a wide range of metals. Can be coated with zinc, lead, tin, and numerous other coatings.

For complete technical information ask for Bulletin 355—52 pages. For prices and design data—Bulletin 257.

Backed by 20 Years of Panel Coil Manufacturing.

DEAN THERMO-PANEL COIL DIVISION
DEAN PRODUCTS, INC. 622 Franklin Ave
BROOKLYN 38, N. Y. Tel. Sterling 9-5400

For more data circle **364** on Reader Service Card

York, N. Y. The Danbury, Connecticut, company finds that money spent on 100 per cent DuPont Orlon clothing is a good investment. Since the workers know the clothing is chemical resistant, they are not concerned with acid damage to clothing, and they plunge into their work with greater enthusiasm, a company official asserts.

Danbury Metal Finishing, well known in the New England area for its cable connectors and other electronic components, works with sodium compounds, palladium, silver, gold, nickel, cadmium, tin, zinc, copper and chromate conversion coatings. Workers are frequently near tanks containing sulfuric, muriatic and nitric acids.

Even with so many highly corrosive chemicals about the plant, the company finds that a pair of Worklon trousers lasts about six months and a Worklon shirt of 100 per cent Orlon will wear for approximately two years. Eventually the garments are discarded because of wear and abrasion. Company officials state that no trouble has been encountered with acid holes in work clothes. Worn remnants are often salvaged by converting them into aprons.

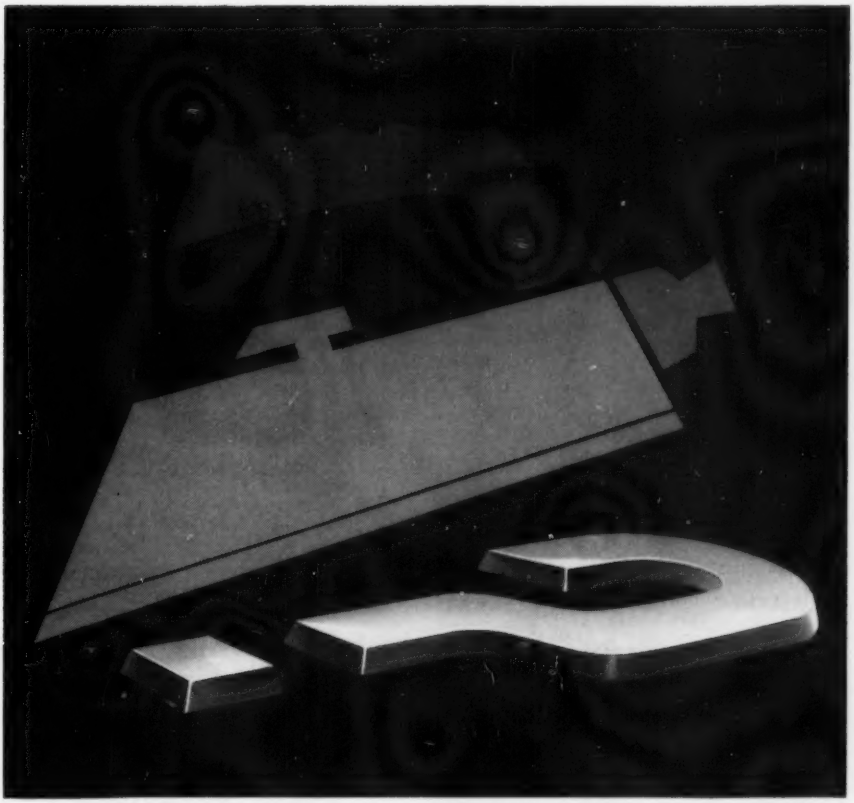
For more data circle **8** on Reader Service Card

★ ★ ★

Heater Manufacturer Avoids Redesigning by Using Silicone Finish

Sometimes using the proper finish can overcome design problems. This was the experience of a heater manufacturer who was recently faced with either redesigning his product or finding a finish to withstand heat.

The manufacturer of the Preway heater found that the upper grille on



Iron out your chrome-plating problems with Diamond

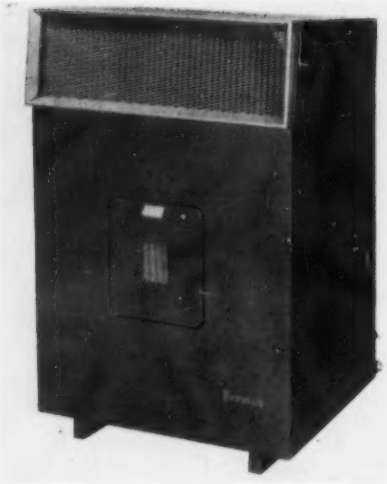
Let DIAMOND's technical specialists go to work on your chrome-plating problems. These men work full time on customers' questions. They come up with complete, profit-making answers. Their service is free.

In producing chromic acid, DIAMOND controls *every* processing step to safeguard quality. DIAMOND experience starts with importing the chrome ore and making the soda ash, and extends through production and delivery. It even includes standing by your side, if you wish, to help you get top-quality plating results and keep costs low.

DIAMOND facilities—two chromic acid plants and nine warehouses and sales offices across the country—assure you uninterrupted supply and dependable service. DIAMOND ALKALI COMPANY, 300 Union Commerce Building, Cleveland 14, Ohio.

Diamond Chemicals

For more data circle **365** on Reader Service Card



Sicon Silicone Finish is used to protect and beautify this Preway heater and at the same time withstand heat produced. (Photograph courtesy Midland Industrial Finishes Company)

Practical Applications . . .

the company's new heater often reached a temperature of 550 deg. F.—too hot for most organic finishes. To overcome the problem, the only answer seemed to be to raise the grille, at considerable redesign expense, so as to gain the necessary protection for the lower part of the heater.

Tests with Sicon, a silicone, heat-resistant finish, however, proved so satisfactory that redesign was unnecessary. This finish was able to withstand the heat and at the same time protect the heater and give it an attractive appearance.

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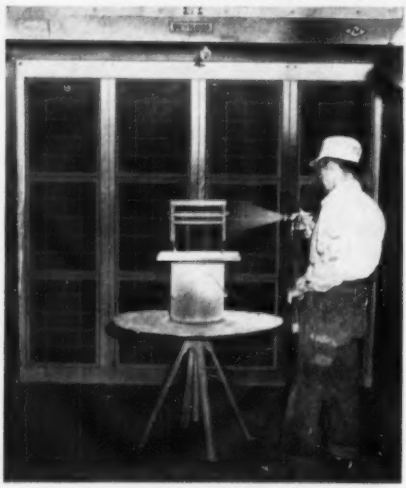

Photo Courtesy Omaha Parlor Frame Co., Omaha, Nebraska

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The booth illustrated is just one of the ways to utilize the many advantages of R P Paint Arrestors to increase efficiency . . . and lower costs. These inexpensive pads trap overspray, are easily replaceable with a minimum of down-time and save on maintenance costs and floor-space. R P Paint Arrestors are adaptable to almost every type of operation. Check the R P way to a better, more economical paint spray booth.

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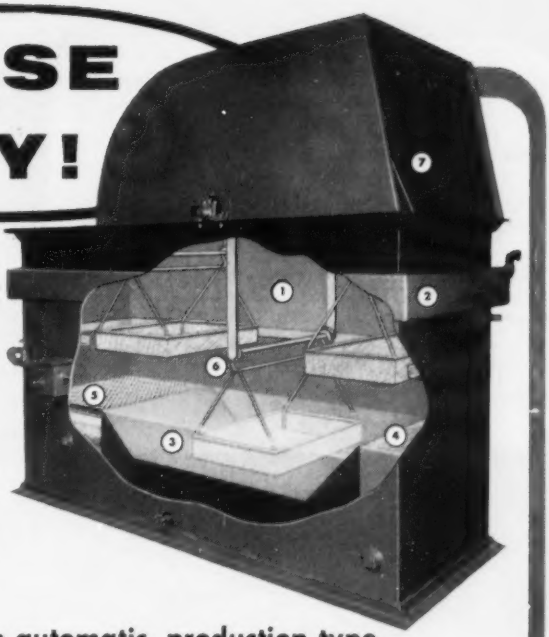

PHILLIPS ROTOMATIC VAPOR DEGREASER WITH LIQUID DIP

Combination of automatic time cycle, liquid solvent dip, and vapor degreasing — all in one unit. Cutaway view illustrates construction and operation: 1—Vapor degreasing area; 2—Condensing water jacket; 3—Cool rinse washes off chips and insolubles; 4—Reso-Kleen sump supplies clean solvent to rinse sump; 5—Boiling sump generates vapor; 6—Rotating reel for baskets, with timed cleaning cycle; 7—Loading and unloading point. Capacities from 1800 to 4000 pounds per hour.

NOW! This automatic, production type degreaser can be yours on purchase or lease

. . . for less than 15c per operating hour!

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This degreaser handles a variety of small metal parts . . . Has adjustable control time cycle . . . Has continuous one-man operation . . . Assures complete cleaning and drying in blind holes and recesses. Available with tumblers for parts that tend to nest.

This machine is one of a complete line of Phillips degreasers. Your Phillips representative can help you determine your needs. Call him today — or write, wire or phone direct.

** Figures are for Model 60RM — Capacity 1800 pounds per hour.*

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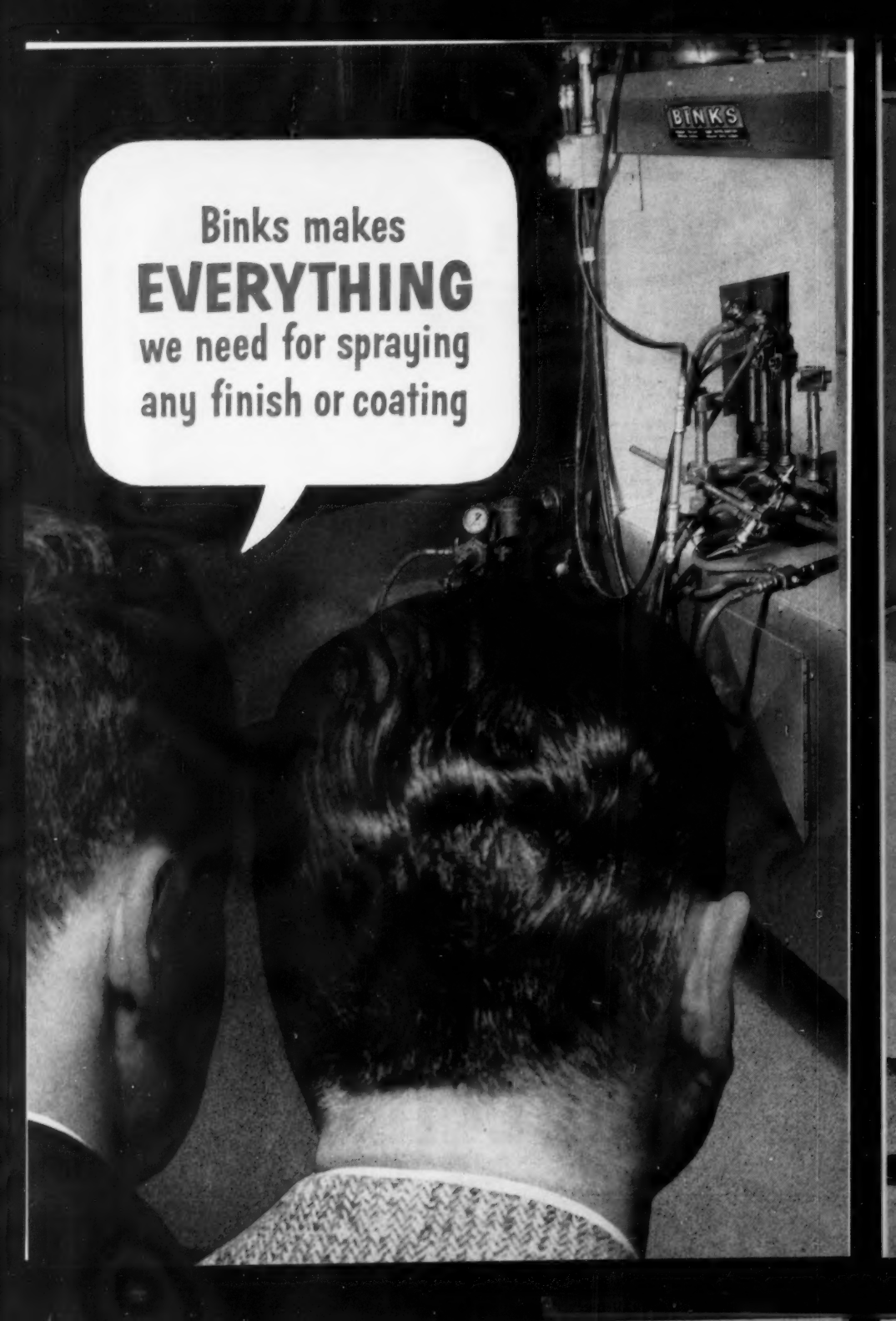
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Non-Blocking Wet Ink Varnish

A non-blocking wet ink varnish for can manufacturers and metal decorators has been developed by the Paint & Brush Division of Pittsburgh Plate Glass Company.

The varnish is said to possess good color retention and outstanding non-blocking properties at various baking schedules, making it particularly useful where plate is coated and stored at high temperature and humidity.

It is especially advantageous for use on beer and beverage cans, frozen fruit cans, and for general metal-decorating work. Additional information is available from Pittsburgh Plate Glass Co., 1 Gateway Center, Pittsburgh 22, Pa.

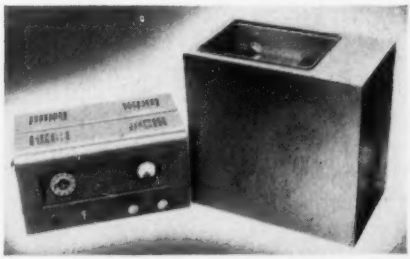
For more data circle **10** on Reader Service Card

★ ★ ★

Self-Filtering Ultrasonic Cleaner

Development of an ultrasonic cleaner with a self-contained filtering system has been announced by Vibro-Ceramics Division of Gulton Industries, Inc.

The Glennite U-102 Circulating Ultrasonic Cleaner operates on a frequency of 40 to 44 kilocycles, incorporates a forced air cooling system, and has a cleaning-tank capacity of one gallon. Only sudsless detergents or chlorinated solvents are required.



Ultrasonic Cleaner has self-contained filter

A circulating pump, permanent filter element and an additional tank for recirculating the fluid eliminates manual filtering.

The circulator automatically begins operating at the conclusion of the predetermined cleaning period.

The cleansing action is achieved by cavitation produced by ultrasonic signals transmitted in liquid. Any small part, tool, or instrument not damaged by immersion in water and/or chlorinated solvents may be safely cleaned with ultrasonics.

For more information about the Glennite U-102 Circulating Ultrasonic Cleaner, write Vibro-Ceramics Division, Gulton Industries, Inc., 212 Durham Ave., Metuchen, N. J.

For more data circle 11 on Reader Service Card

★ ★ ★

Automatic Plating Machine

An automatic plating machine with an elevator mechanism that permits location of elevator stations at regular, fixed intervals, rather than at varied intervals governed by tank-transfer operations, has been introduced by Wagner Brothers, Inc., Detroit, Mich.

The elevator on this machine has a gear-driven mechanism that permits either transfer (lift) or horizontal motion by the elevators at any point in

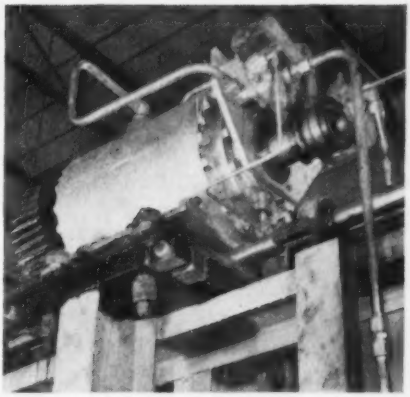


Fig. 2—Closeup view of hydraulic motor which powers the elevating mechanism on Wagner Brothers automatic plating machine.

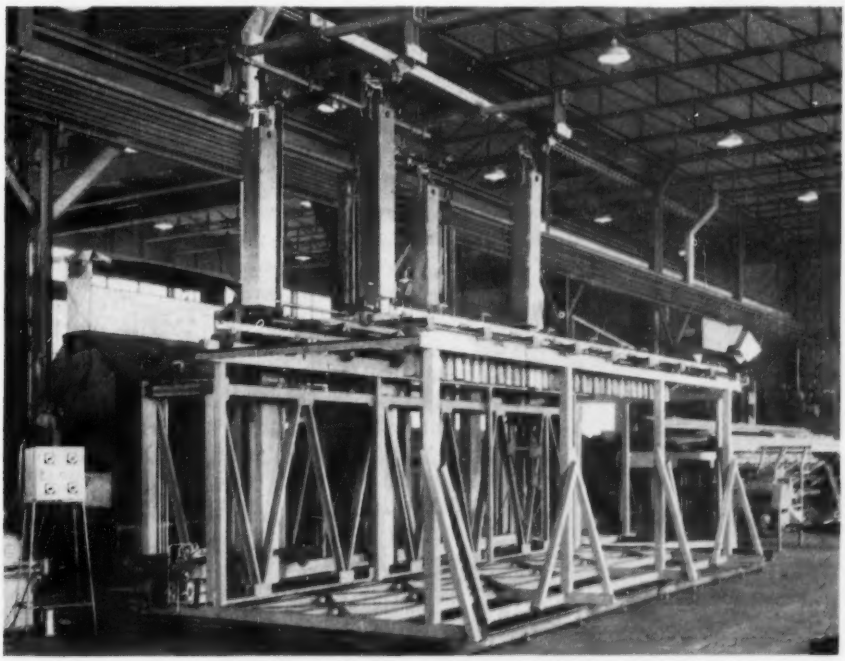


Fig. 1—A working unit of the Wagner "Tadmu" automatic plating machine, with the elevating mechanism completely extended. No moving parts are over the plating tanks.

the span of the machine.

Since the machine has increased lifting capacity, elevator stations can be spaced far enough apart to obtain a repetitive pattern throughout the basic structures of the mechanism — the base unit, the panels, and the carriage assembly.

This elevator mechanism is a "package" unit, complete with housing. It requires no additional machining or parts during installation. The complete elevator assembly can be mounted in 45 minutes, the manufacturer states.

Various structural units of this machine are joined by friction clamps. This type of clamp is used to join the cross arm which supports the lifting angle to the elevator boom and on other parts of the machine. By using this type of clamp, drilling and welding of attaching members during installation is eliminated; members are adjustable for alignment during installation and service; and individual components and sub assemblies can be replaced without disturbing the entire unit.

A special compensating assembly used on this machine permits spacing of work racks within multiple-station units to give maximum operating efficiency. Such flexibility in rack spacing allows use of higher current densities without burning the work, it is stated, and also allows the machine to be shorter, thus requiring less floor space.

Since there is no impact when

To page 114→

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the pusher and carrier assemblies contact each other, wear is reduced, operation is quieter, and wear on carrier shoes is lessened.

The compensating unit permits two-way adjustment in the length of the pusher-assembly stroke — to a point where it can equal or exceed the length of the carriage or transfer stroke. This means that the thickness of metal deposited within any given tank can be varied without affecting the overall cycle.

The machine also incorporates an improved method of moving racks horizontally within each plating bath. It is said to increase the life of the pusher subassembly, improve performance, and lessen maintenance work. This mechanism consists of an inverted, wide-mouthed V-pusher lock mounted on the pusher arm I-beam, and a special carrier key attached to the rack carrier bar. Power for horizontal travel is supplied by a hydromotor, which is said to improve smoothness of acceleration and deceleration. This arrangement assures positive engagement between the pusher lock and the carrier key to prevent misalignment during horizontal travel of the carriers.

Since this design requires no moving parts directly over the baths, the corrosion problem is lessened. The absence of moving parts over the baths also eliminates the possibility of lubricants contaminating the bath.

The Wagner machine uses ball

Circo Vapor Degreasers use 30% less solvent

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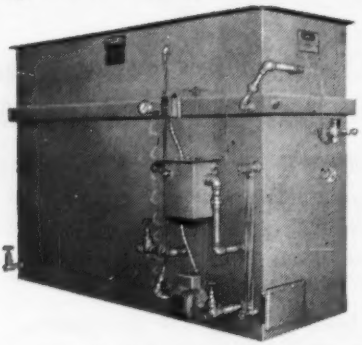

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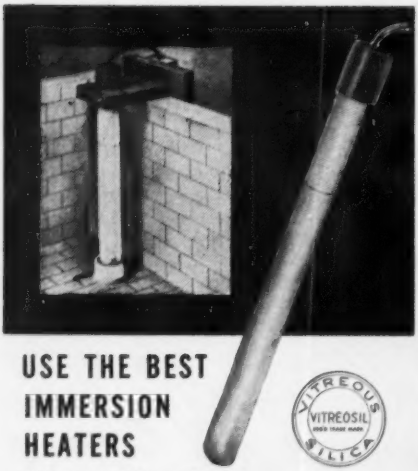

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bearings to support the carriage. The ball bearings are said to result in smoother carriage action and help the carriage remain centered and adjusted relative to the center line of the machine. The ball track assemblies are connected to a central lubrication system.

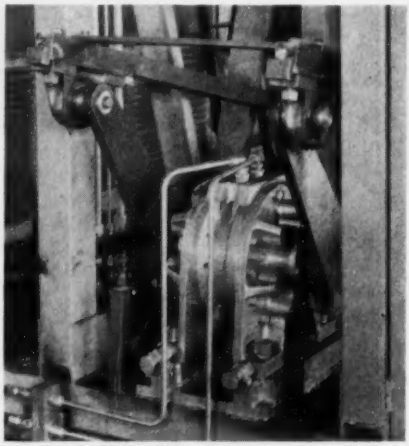


Fig. 3—Closeup view of hydraulic motor which powers the transfer mechanism on Wagner Brothers automatic plating machine.

A number of automatic plating machines of this type have already been installed.

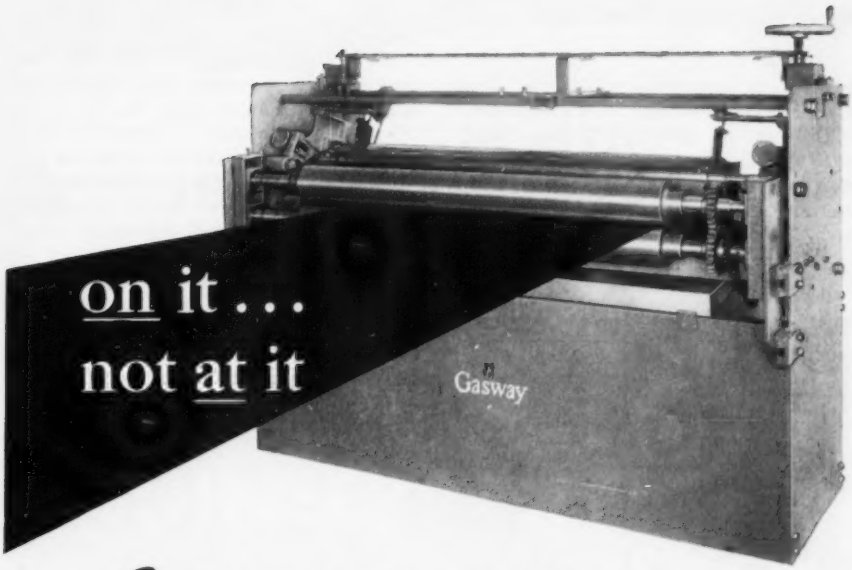
For more data circle 12 on Reader Service Card

★ ★ ★

Ultrasonic Generator

Branson Ultrasonic Corporation, Stamford, Conn., has introduced Sonogen Model AP-25-B ultrasonic generator, designed for use with standard Branson tank-type or all-welded stainless steel immersible transducers.

It is suitable for use in ultrasonic cleaning small parts, such as watch mechanisms, jewelry, instruments,



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transistors and other electronic units, anti-friction bearings, and components that must be dirt-free before assembly. For cleaning-rinsing or other two-step operations, the generator output can be switched between transducers mounted in separate tanks.

Rated r-f output of the 10 by 16 by 12-inch-deep generator is 125 watts average power, with peak power on pulses of 500 watts.

As a companion unit, Branson recommends a matched tank-transducer combination, measuring 6½ by 8 by 10 inches high, with a cleaning area of 52 square inches. Mounted on the false bottom of a two-gallon-capacity tank, the transducer sends ultrasonic energy up throughout the entire vessel for uniform cleaning.

Because the tank is of stainless steel, organic solvents, detergents, alkaline solutions, and some acids may be used without harming the transducer. When strong acids are needed, the acid and objects to be cleaned are put in a plastic or glass beaker. This container is then coupled ultrasonically to the transducer by means of the liquid in the tank proper, usually water with detergent or wetting agent.

The generator can also be used to drive up to three type B (bulkhead-mounted) immersible transducers, or one 125-watt type E transducer. These are all meant for mounting in the user's present cleaning tanks, or in tanks made to order.

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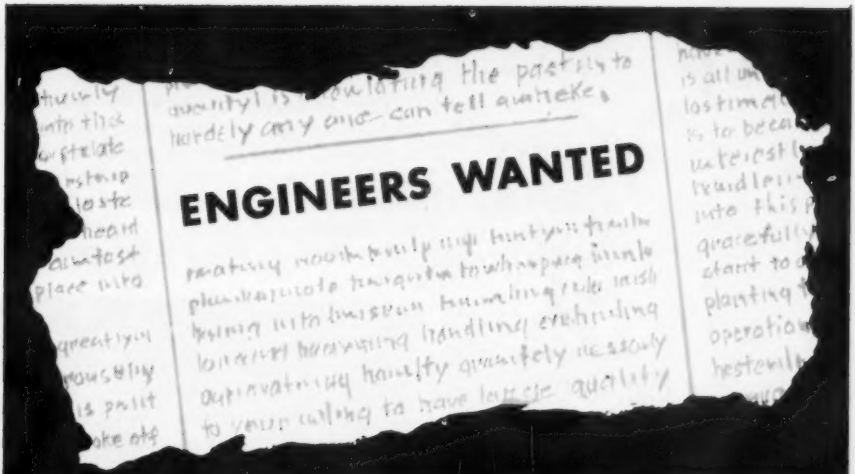

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For more data circle **378** on Reader Service Card

New Processes, Materials

The Sonogen cleans by sending high-frequency pressure waves through a solution. These waves cause "cavitation," a process which literally blasts dirt off all surfaces in contact with the liquid.

For further data on the Sonogen

Model AP-25-B ultrasonic generators in back row are shown with some of the different transducers they can drive. Left to right, all-welded stainless steel enclosed type B-36; type T-52 tank/transducer combination; immersible-type B-18 for bulkhead mounting; end, extreme right, type E-40 immersible.

AP-25-B generator and other ultrasonic cleaning equipment, write to Dept. PF, Branson Ultrasonic Corp., 26 Brown House Rd., Stamford, Conn.

For more data circle **13** on Reader Service Card

★ ★ ★

Metal-Preparation Products

Enthone, Inc., 442 Elm St., New Haven, Conn., has announced two processes for cleaning and activating metals prior to electroplating.

The Enbond "Z" process, for the treatment of zinc-base diecastings,

New **Work-Saver** feature in

WALKER RECTIFIERS

Prevents Costly Work Spoilage and Germanium Burnout

Now the low-cost Walker Rectifier, designed to solve your electroplating and anodizing problems, incorporates another cost-cutting feature — the new Walker Work-Saver.

The Work-Saver automatically cuts current back to a pre-determined level and because of elevated temperature prevents costly work spoilage and germanium burnout.

Of course, Walker Rectifiers, Silicon, Germanium, Selenium — retain the many proven features that mean long, trouble-free operating life. Designed to highest standards, there are no moving parts, nothing to wear out, nothing to get out of adjustment. Walker Rectifiers have a power factor of 97% and a D.C. ripple of about 4%.

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utilizes a carefully formulated and balanced anodic electrocleaner and a companion acidic activator to produce a uniformly active surface that is ready for standard copper plating. If precleaning is required for removal of large amounts of buffing compounds, the use of one of the standard Enthone Emulsion Cleaners can be incorporated into the cycle without further changes.

The Enbond "Z" cleaner and activator are both supplied as powders. The activator has been designed for long life. Both the cleaner and the activator are formulated to be useful over a wide range of concentration, temperature and time; thus the process can be used in existing manual or automatic cycles without change in speed unless increased production or thickness of deposit is desired.

The second process, called the Enbond "BR" process, is similar to the Enbond "Z" process, but is intended for preparation of brass and other copper alloys. Both the cleaner and the activator are powdered products. They can also be used for preparation of many steels. Precleaning may be required when both copper and iron alloys are treated in the same baths. As with zinc and the Enbond "Z" process, the copper alloy surface produced by this process is uniformly active, so that maximum adhesion and brightness of metal deposit can be attained.

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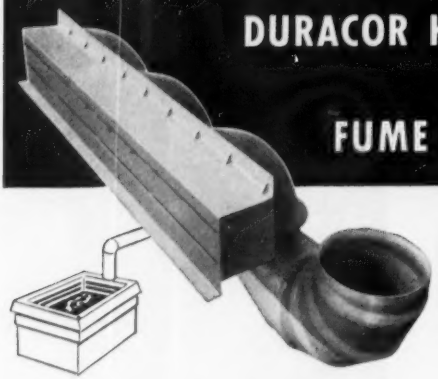
CORROSION-PROOF

DURACOR HOODS AND FUME DUCTS



DURABLE glass fibre reinforced plastic in a complete range of shapes and sizes

Newly developed for handling fumes from highly corrosive chemicals in operations such as plating and pickling, DURACOR hoods and ducts provide permanent resistance to corrosion.

They are fabricated from specially compounded thermo-setting plastics which are combined with glass or other synthetic fibers. Hoods and ducts can be produced in almost any desired shape. They are light in weight, durable and strong (up to 30,000 psi flexural strength). Write today for complete information.

DURACOR CEILCOTE

DURAGOR is another development by CEILCOTE!

THE CEILCOTE COMPANY, INC.

4848 Ridge Rd. Cleveland 9, Ohio

7523-CC

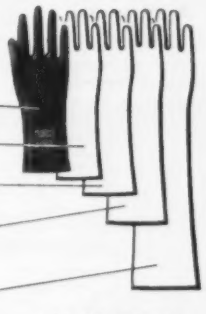
For more data circle **380** on Reader Service Card

These Stanzoil® Milled Neoprene Gloves

. . . Guarantee Positive Liquidproof Protection in 103 Basic Oils, Acids, Caustics, Greases, Solvents

Black All Neoprene Stanzoils With Non-slip Grip

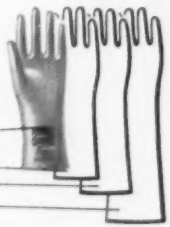
Model	Weight	Fingers	Length
N-31	Light	Straight	10½"
N-35	Light	Curved	10½"
N-32	Medium	Straight	11"
N-36	Medium	Curved	11"
N-41	Heavy	Straight	12"
N-44	Heavy	Curved	12"
N-51	Heavy	Straight	14"
N-33	Heavy	Straight	14"
N-54	Heavy	Curved	14"
N-71	Heavy	Straight	18"
N-73	Heavy	Straight	18"
N-74	Heavy	Curved	18"



White All Neoprene Stanzoils With Smooth Finish

Model	Weight	Fingers	Length
N-30	Light	Curved*	10½"
NW-31	Light	Straight	10½"
NW-32	Medium	Straight	11"
NW-41	Heavy	Straight	12"
NW-51	Heavy	Straight	14"

*Non-slip



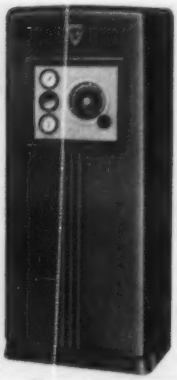
FREE Hand Protection Analysis... Send a description of your job requirements (length, dexterity, wear resistance, chemicals used, importance of safe grip, hot or cold temperature extremes, fatigue factor and sizes) to our "Hand Protection Clinic." New catalog and price list available on request.

the **PIONEER** Rubber Company
285 Tiffin Road
Willard, Ohio

For more data circle **381** on Reader Service Card

Chlorinators

The introduction of two chlorinators has been announced by Wallace & Tiernan, Inc., 25 Main St., Belleville 9, N. J. These chlorinators feature an improved metering and controlling principle — the V-notch Variable-Orifice.



V-notch Chlorinator

The chlorinators cover a feed range from 25 pounds per day to 2,000 pounds per 24 hours. The Series A-712 Wide Range Model features direct reading dial indication of the feed rate with plus or minus 4 per cent accuracy over a 20 to one range for any V-notch Variable-Orifice. The Series A-711 Chlorinator provides a rotameter for feed rate indication, giving accuracy over a 10 to one range for any one rotameter.

V-notch Variable-Orifice control gives precise and smooth chlorine feed control over a wider range.

For more data circle **15** on Reader Service Card

★ ★ ★

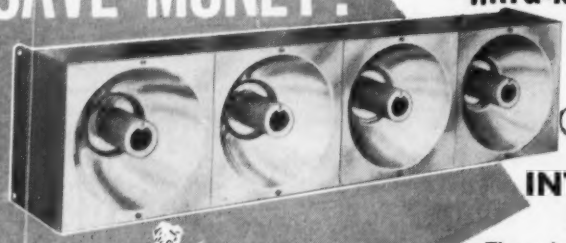
Plated Metal Strip

Sylvania Electric Products, Inc., has announced the development of a process for plating strip metals. The process permits plating a wide variety of base metals with common plating materials.

The strip produced by the process can be used in place of the clad metals used in the fabrication of many electronic tube parts. By using the preplated strip, the need for plating parts after forming is also eliminated; therefore, assembly techniques previously

SAVE MONEY!

By Building Your Own Controlled Temperature Infra-Red Ovens with driQuik INTERLOCKING SECTIONS



OVENS ANY SIZE OR SHAPE

The only lava coated ceramic type generators ever developed, they give more even, more intense far infra-red energy with less power consumption. Dark burning—no injury to eyes. Impervious to vibration, shock, vapor and moisture.

NO SOCKETS TO BURN OUT— therefore a minimum of maintenance expense in any application. Write TODAY for literature.

driQuik DIVISION

DRY CLIME LAMP CORP.
GREENSBURG, INDIANA

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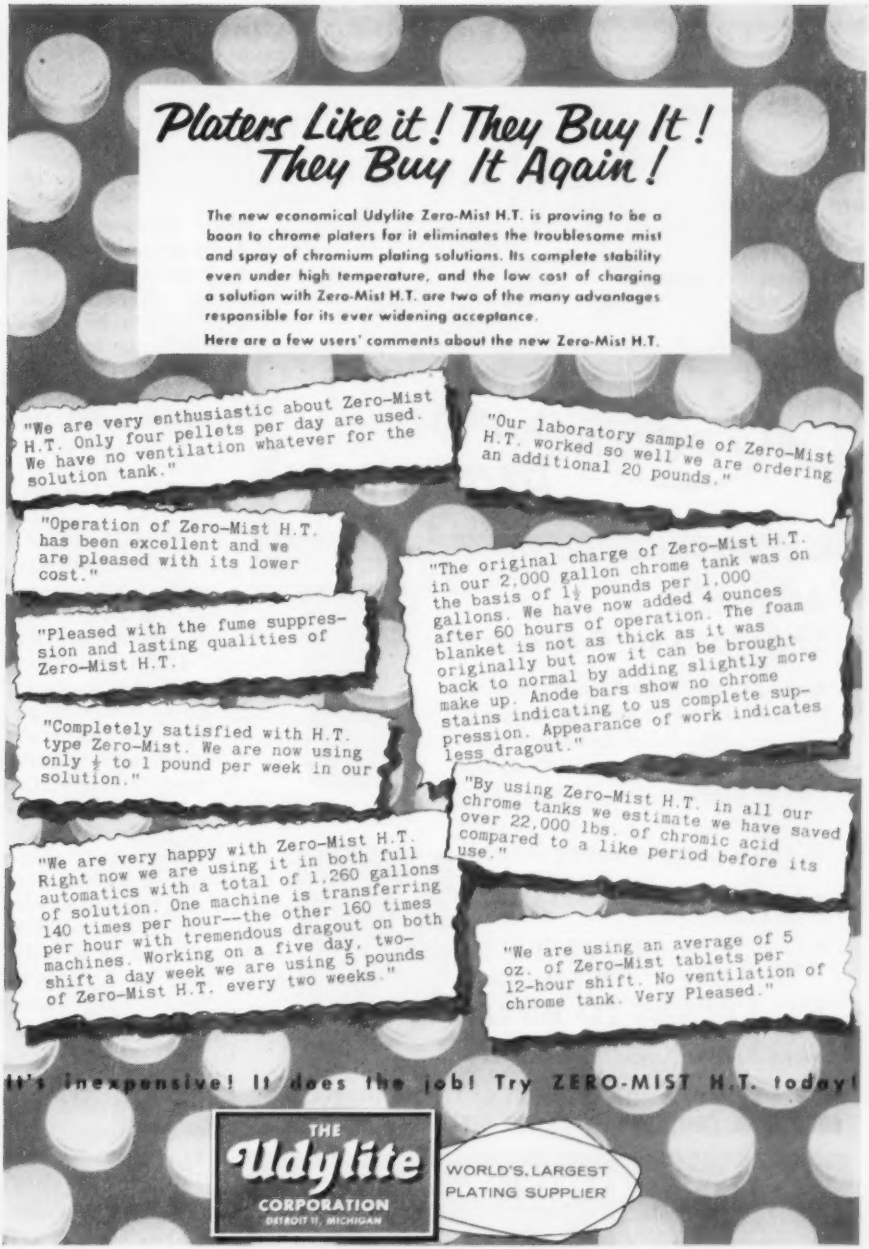

Platers Like it! They Buy It! They Buy It Again!
The new economical Udylite Zero-Mist H.T. is proving to be a boon to chrome platers for it eliminates the troublesome mist and spray of chromium plating solutions. Its complete stability even under high temperature, and the low cost of charging a solution with Zero-Mist H.T. are two of the many advantages responsible for its ever widening acceptance.
Here are a few users' comments about the new Zero-Mist H.T.
"We are very enthusiastic about Zero-Mist H.T. Only four pellets per day are used. We have no ventilation whatever for the solution tank."
"Our laboratory sample of Zero-Mist H.T. worked so well we are ordering an additional 20 pounds."
"Operation of Zero-Mist H.T. has been excellent and we are pleased with its lower cost."
"The original charge of Zero-Mist H.T. in our 2,000 gallon chrome tank was on the basis of 1½ pounds per 1,000 gallons. We have now added 4 ounces after 60 hours of operation. The foam blanket is not as thick as it was originally but now it can be brought back to normal by adding slightly more make up. Anode bars show no chrome stains indicating to us complete suppression. Appearance of work indicates less dragout."
"Pleased with the fume suppression and lasting qualities of Zero-Mist H.T.
"Completely satisfied with H.T. type Zero-Mist. We are now using only ½ to 1 pound per week in our solution."
"By using Zero-Mist H.T. in all our chrome tanks we estimate we have saved over 22,000 lbs. of chromic acid compared to a like period before its use."
"We are very happy with Zero-Mist H.T. Right now we are using it in both full automatics with a total of 1,260 gallons of solution. One machine is transferring 140 times per hour--the other 160 times per hour with tremendous dragout on both machines. Working on a five day, two-shift a day week we are using 5 pounds of Zero-Mist H.T. every two weeks."
"We are using an average of 5 oz. of Zero-Mist tablets per 12-hour shift. No ventilation of chrome tank. Very Pleased."
It's inexpensive! It does the job! Try ZERO-MIST H.T. today!
THE Udylite CORPORATION
DETROIT 11, MICHIGAN
WORLD'S LARGEST PLATING SUPPLIER

For more data circle **383** on Reader Service Card

impossible because of the necessity of plating formed metal parts are now feasible.

Applications of the Sylvania process are described in a product bulletin, "Plated Metal Strip," now available from Sylvania's parts division, 12 Second Ave., Warren, Pa.

For more data circle **16** on Reader Service Card

Plating Rectifier

A rectifier made by Clinton Supply Co., Rectifier Manufacturing Div., 110-112 S. Clinton St., Chicago 6, Ill., features the "Dual-A-Matic" Transformer Circuit, which permits the maximum name-plate d.c. amperage to be drawn on either the two- or twelve-volt operating range without reconnecting external d.c. connections.

A lever protruding through the side of the cabinet permits voltage adjustments to be made instantly by simply moving the lever up or down and turning the top switches to required voltage.

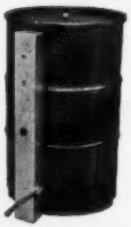
Other features of this unit include a grill-protected updraft cooling system and a totally enclosed motor; an NEMA-type electromagnetic starter with automatic reset thermal overload protection, remotely controlled by fully enclosed push buttons; an electronic sensing device that shuts off the unit when the d.c. ampere rating is exceeded; and a cabinet finished to resist corrosive fumes.

Several models are available incorporating these features, with ratings of from 750 to 7,500 amperes. Litera-

Aircon VAPOR DEGREASERS

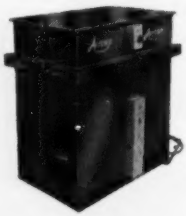
ANY SIZE . . .
Standard or Custom

Aircon Vapor Degreasing Systems are available in a complete line, ranging in size, from the smaller bench and barrel-type units to the larger, permanent, high capacity degreasers.



Aircon Degreasers are:

- GAS, ELECTRIC OR STEAM HEATED
- COMPLETE UNITS WITH ALL SAFETY EQUIPMENT



NO EXTRAS TO BUY!

Write today for full information

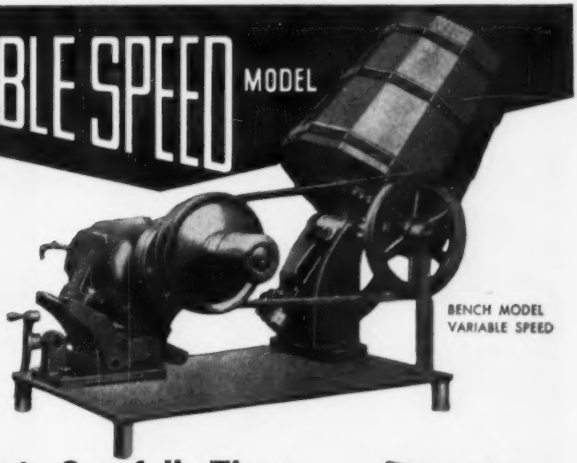
WE ARE DESIGNERS AND ENGINEERS OF SPECIAL DEGREASING EQUIPMENT. CONSULT US ON YOUR DEGREASING PROBLEMS.

Armstrong & White
CHESWICK, PENNSYLVANIA

For more data circle **384** on Reader Service Card

INVESTIGATE THIS TIME-SAVING

VARIABLE SPEED MODEL



BENCH MODEL
VARIABLE SPEED

Bench-Type Single Speed

No. 5—Single Speed

No. 5A—Single Speed

No. 6—Single Speed

Note Carefully These IMPORTANT POINTS

Barrels can be filled with parts or abrasive—*while running.*

Work can be watched — samples removed for inspection — *while running.*

Angle can be changed for best abrasive or polishing action — *while running.*

Barrels can be emptied by tilting to pouring position — *while running.*

Barrels are made in various sizes, shapes, and materials. They are easily replaced.

No. 5—Variable Speed

No. 5A—Variable Speed

No. 6—Variable Speed

If You're a Tumbler, Send for This NEW CATALOG

THE HENDERSON BROS. COMPANY

"The Tumbling Barrel People"

134 SOUTH LEONARD STREET
WATERBURY, CONNECTICUT

SINCE 1880 DESIGNERS AND BUILDERS OF TUMBLING BARREL EQUIPMENT

For more data circle **385** on Reader Service Card

● **Use Duracoat®...**

chromate conversion coatings for zinc, cadmium, copper, brass, bronze and aluminum. Clear, irridescent, golden or olive drab. Available in liquids or powders.

Write for literature, send samples for treatment or give us your problems — our laboratory staff is available to help solve them.

A new folder describing the full line of black oxide finishes, chromate finishes, cleaners, oils, and strippers is yours for the asking.

Heatbath Corporation

Springfield 1, Mass.

or 701 North Sangamon Street, Chicago 22, Illinois

34 Years of Service to the Heat Treating and Metal Finishing Industry

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ture describing them in detail is available from Clinton Supply Co., Recti-

Clinton Rectifier: Dual-O-Matic Voltage

fier Manufacturing Div., Dept. PF, 110-112 S. Clinton St., Chicago 6, Ill.
For more data circle **17** on Reader Service Card

★ ★ ★

Portable Hot Spray

A mobile hot spray unit recently introduced by the Spee-Flo Co., Houston, Texas, provides heated paint for two spray guns on hoses up to 75 feet in length.

The recently introduced Spee-Flo Chieftain series incorporates a hot spray heater and reciprocating pump in a portable unit that will carry a five- or ten-gallon container of paint. Another similar unit on a four-wheel cart will carry a 55-gallon drum of paint.

The portable hot sprayer is partic-

ONE DIP, AND ZIP...

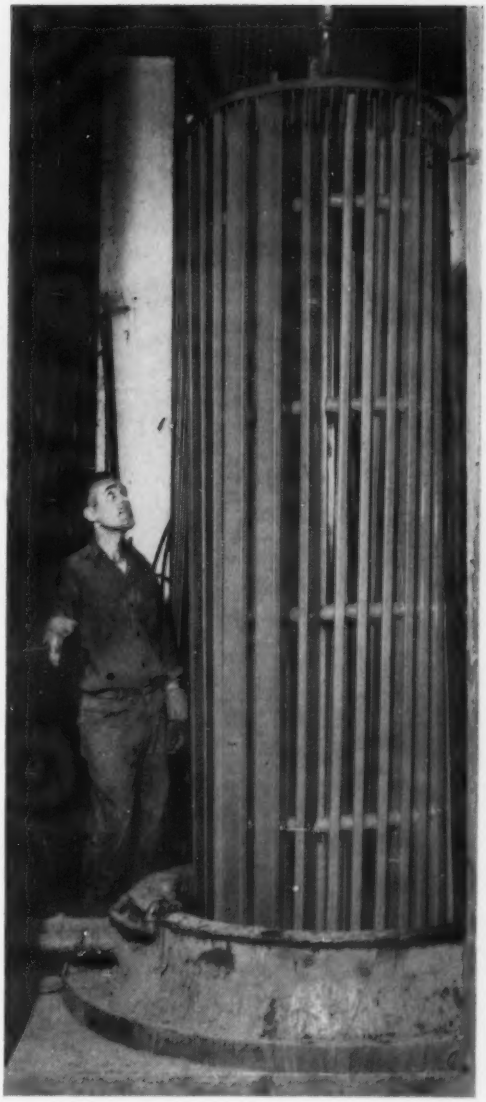
This Walkerduct is double-armored...thanks to Parlon®-based Paint

Walker Brothers of Conshohocken, Pennsylvania, are justly proud of the Dualcote finish on their electrical raceways and conduit because of the severity of service which it will withstand. On top of a special "fused" coat of zinc a special Parlon-based protective coating is applied.

The result is a product that is thoroughly protected inside and out. The zinc protects the steel; the Parlon chlorinated rubber coating in turn protects the zinc. This double-armored finish will thus withstand attack by acids, alkalies, condensation, even salt water immersion—as has been proved by many tests.

Here, in these products, is a two-pronged weapon in the never-ending battle against corrosion. The Dualcote finish itself insures minimum maintenance for your electrical system. And a properly formulated Parlon-fortified system can almost singlehandedly solve your equipment and structural maintenance worries.

More than 400 paint companies know and use Parlon in many of their extra service maintenance paints—for metal, concrete, masonry, and wood. Therefore, ask your regular source what the right Parlon-based paints can do for you.



Cellulose Products Department

HERCULES POWDER COMPANY

INCORPORATED

900 Market Street, Wilmington 99, Delaware

CR57-6

For more data circle **387** on Reader Service Card

ularly useful for industrial and maintenance painting requirements where long lines and portability are required.

Equipped with U.L.-Approved heater and divorced-action pump, the unit circulates paint continuously from heater to gun, so as to maintain a uniform paint temperature.

The Spee-Flo Chieftain Series Hot Spray Heater: portable and self-contained

Literature illustrating this equipment is available from the Spee-Flo Co., 720 Polk Ave., Houston, Texas.

For more data circle **18** on Reader Service Card

★ ★ ★

Small Blast Cleaning Table

Pangborn Corporation, Hagerstown, Md., has introduced a four-foot Roto-blast table room for cleaning all types

WOOD TANKS FOR PLATING AND PICKLING

• Give us your requirements . . . we'll build it from the finest woods, to fit your needs *exactly!*

Send for details.

WOOD TANK DIVISION

Kalamazoo TANK & SILO CO.

1571 Harrison Street, Kalamazoo, Michigan

For more data circle **388** on Reader Service Card

POWDERED CHROMATES

Promat offers you a complete line of conversion coatings which are economical to use and designed to meet the requirements of individual specifications.

PROMAT

Many years of research and the use of the finest chemicals enables Promat to meet the highest standards in the metal finishing field. Send for free technical information and copy of "Promat's Progress."

PROMAT DIVISION - POOR & COMPANY

851 SOUTH MARKET STREET PF-3 WAUKEGAN, ILLINOIS

Manufacturing Plants Waukegan, Ill. Philadelphia, Pa. Gardena, Calif.

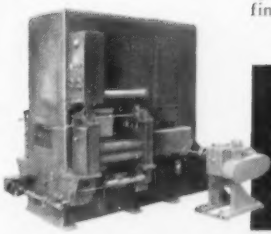
For additional information and technical assistance write Promat Division — Poor and Company

For more data circle **389** on Reader Service Card

HILL GRINDING AND POLISHING MACHINES
For FINISHING
Any and All
FERROUS and NON-FERROUS MATERIALS . . .

HILL Polishing Machine
(Hydraulic Table Type)
For polishing individual sheets and plates. Hydraulic reciprocating table with centralized controls.

The basic HILL two-roll vertical head with upper steel idler roll and lower rubber covered contact or work roll (both dynamically balanced) over which the endless abrasive belt travels.



HILL Grinding and Polishing Machine
(Pinch-roll Type)
For pre-finishing, conditioning and polishing. Used as single units or in multiple units for progressive line polishing in wet or dry operations.

FLAT surfaces of ferrous or non-ferrous material can be brought quickly to the high finish so necessary for today's industrial and consumer products. The dairy, automotive, home appliance and engraving industries are typical of the wide range of application for these precise, labor saving machines.

HILL abrasive belt grinding and polishing machines are built in two general types. The hydraulic reciprocating table type polished individual sheets and plates. Table widths vary from 36" to 60". Table lengths range from 60" to 240". The Pinch-Roll type is for progressive line polishing. The HILL two-roll vertical head with endless abrasive belt is the basic principle common to both types.

When writing for information please indicate size and specifications of stock to be finished.

THE HILL ACME COMPANY

HILL DIVISION
ESTABLISHED 1882
1201 West 65th Street • Cleveland 2, Ohio

"HILL" GRINDING & POLISHING MACHINES • HYDRAULIC SURFACE GRINDERS • ALSO MANUFACTURERS OF "ACME" FORGING • THREADING • TAPPING MACHINES • "CANTON" ALLIGATOR SHEARS • BILLET SHEARS • "CLEVELAND" KNIVES • SHEAR BLADES

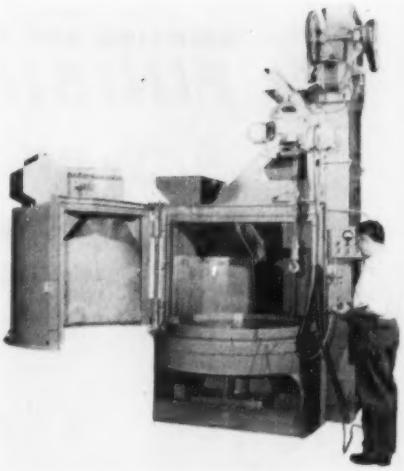
For more data circle 390 on Reader Service Card

of work in plants that require a small, flexible machine for cleaning operations. Castings, forgings and stampings up to 48 inches in diameter by 24 inches high can be processed in this unit.

Capable of Rotoblasting loads weighing up to 4,000 pounds, this table is equipped with a cast-labyrinth abrasive-sealing system that makes the cabinet abrasive-tight without rubber gaskets.

For efficient loading, a single door opens to expose half of the 48-inch-diameter rotating work table.

A single overhead Rotoblast wheel, powered by a 10-h.p. motor, will throw 15,000 pounds of abrasive per hour. For extra cleaning capacity, an optional 15-h.p. motor is available that will throw 22,000 pounds of abrasive per hour.

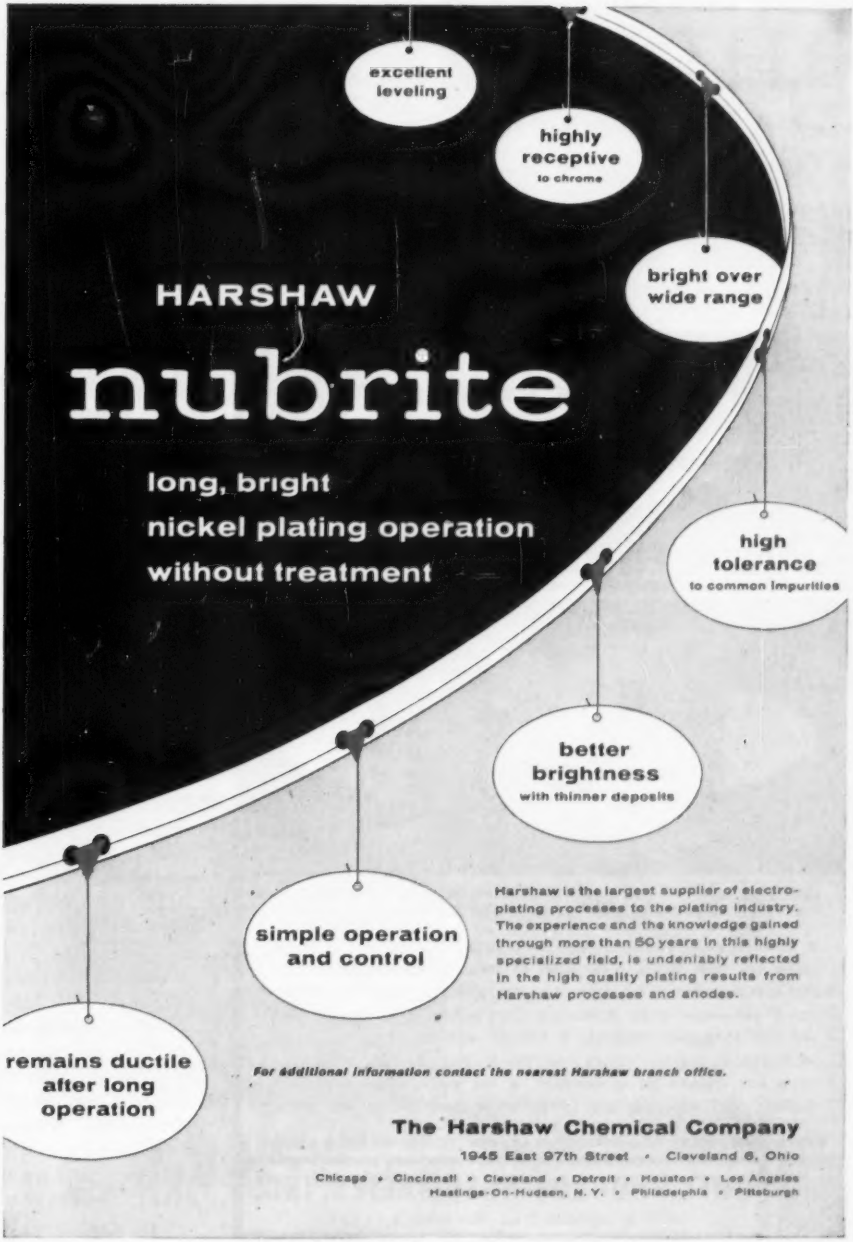


Small Pangborn Rotoblast Cleaning Table

For maximum abrasive efficiency, a self-contained automatic elevator and

STOP COSTLY HANDWORK
Easy LICKS TOUGH JOBS WITH DUAL-ACTION
HEAVY GRINDING, SANDING, DEBURRING TO MICRO-FINISHING
Easy
Model DA Air.
TOPS ON WOOD
The "Dual Action" has proven outstanding on many wood finishing applications, white sanding (hard or soft grain), sealer coats, sealing end grain and many others on Flat or Curved work.
Ask your Jobber for Demo. or write
DUAL-ACTION OR STRAIGHT LINE, AN Easy FOR EVERY JOB.
Model DF Electric.
Model JR Air.
DETROIT SURFACING MACHINE CO.
1266 EAST EIGHT MILE ROAD, DETROIT 20, MICHIGAN

For more data circle **391** on Reader Service Card


excellent leveling
highly receptive to chrome
bright over wide range
HARSHAW
nubrite
long, bright nickel plating operation without treatment
high tolerance to common impurities
better brightness with thinner deposits
simple operation and control
remains ductile after long operation
Harshaw is the largest supplier of electroplating processes to the plating industry. The experience and the knowledge gained through more than 50 years in this highly specialized field, is undeniably reflected in the high quality plating results from Harshaw processes and anodes.
For additional information contact the nearest Harshaw branch office.
The Harshaw Chemical Company
1945 East 97th Street • Cleveland 6, Ohio
Chicago • Cincinnati • Cleveland • Detroit • Houston • Los Angeles
Hastings-On-Hudson, N.Y. • Philadelphia • Pittsburgh

For more data circle 392 on Reader Service Card

separator continuously clean used abrasive for recirculation to the Roto-blast wheel.

Engineering information may be obtained from Pangborn Corp., 5000 Pangborn Blvd., Hagerstown, Md.

For more data circle **19** on Reader Service Card

★ ★ ★

Fire-Resistant Buffs

Schaffner Manufacturing Company, Inc., Schaffner Center, Emsworth, Pittsburgh 2, Pennsylvania, has introduced a line of buffs made by a process that gives the buffs excellent resistance to fire. The recently introduced wheels are known as Schaffner Bias-Type Aircooled Fire Chief Buffs. Further data is available from the the company on request.

For more data circle **20** on Reader Service Card

★ ★ ★

"Pre-Fab" Infrared Oven

Wil-Son Manufacturing Company, Cloverport, Ky., has introduced a "packaged" oven assembly that can be put together easily in almost any height or width necessary to accommodate the product being baked.

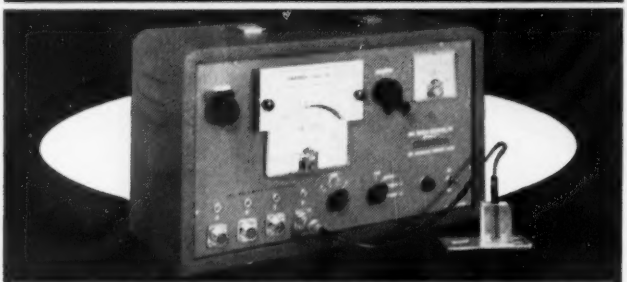
The Wil-Son oven is provided with "Dual-Channel Frame Structure." This type of construction permits sliding adjustment during assembly to change the size of the oven. The framing has no matching holes; instead, it has continuous slide adjustment, so that the entire oven can be changed to accommodate different dimensions of the product passing through.

The recently announced oven assembly is strong enough after erection

To page 138→

THE NEW VERSATILE NON-DESTRUCTIVE COATING-THICKNESS TESTER

DERMITRON



Unit Process Assemblies, Inc., pioneers in non-destructive testing and specialists in electronics for metal finishing, offer their latest DERMITRON D-2 with these features:

■ Measures plated coatings on steel, brass, copper, zinc die-cast, aluminum, bronze and other metals; also, nickel on steel. ■ Measures anodize and hard-coat on aluminum and magnesium; also, paint, porcelain, organic coatings on non-ferrous metals. ■ Measures metal coatings on plastics, ceramics and other non-metallic materials. ■ Available with FOUR measuring probes for extra-wide thickness ranges from thin to thick deposits. ■ Only 1/8" circle area required for measurement. ■ You get fast, accurate, direct readings, plus versatility and portability. ■ Sorts metals and alloys.

Write for latest brochure and questionnaire to help solve your thickness testing problems.

UPA

UNIT PROCESS ASSEMBLIES, INC.

61 East Fourth Street • New York 3, N. Y.

For more data circle **393** on Reader Service Card

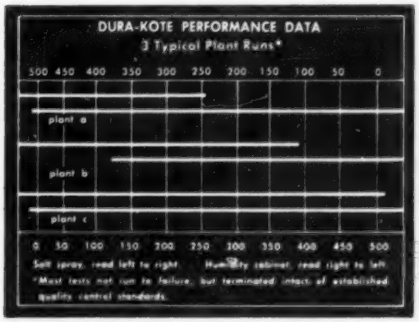
DuBOIS

PHOSPHATIZING BULLETIN

New Formula Dura-Kote Gives Excellent "Tooth" For Paint—Low Using Cost—No Dusting—No Sludging—Maximum Paint Adherence, Too

By Samuel J. Miller, *chemical director, The DuBois Co., Inc.*

Dura-Kote is the easily controlled, non-sludging, detergent-phosphatizer for cleaning and surface conditioning metal. Assures adherence of paints, enamels, japans and other organic finishes, particularly under severe conditions or where water, humidity, equipment or soil conditions have caused trouble with streaking or apparent rusting.


DURA-KOTE PERFORMANCE DATA
3 Typical Plant Runs*
500 450 400 350 300 250 200 150 100 50 0
plant a
plant b
plant c
0 50 100 150 200 250 300 350 400 450 500
Salt spray, read left to right. Humidity cabinet, read right to left.
*Most tests not run to failure, but terminated intacts of established quality control standards.

Dura-Kote *cleans and phosphatizes in one stage.* The gray-bluish colored phosphate coating deposited by the Dura-Kote solution gives excellent "tooth" for paint. Should the painted object get scratched or gouged, Dura-Kote forms a corrosion barrier which stops rust spread. Paint films show maximum resistance in humidity cabinet testing.

Note the low use cost feature of Dura-Kote because of high square footage per pound yield of phosphatized metal. Works for long periods and is easy to control. *The bath works for many days* with simple one product additions to tank based chiefly on direct titration.

FREE DAILY CONTROL RECORD BOOK

Send a copy of DuBois Daily Control booklet for 3- and 5-stage phosphatizing operations, without obligation:

Name_____

Plant Name_____

Address_____

City, State_____

The DuBOIS Co., Inc.

1120 West Front Street, Cincinnati 3

Representatives and Warehouses Coast-to-Coast

CINCINNATI · LOS ANGELES · NEW YORK · DALLAS

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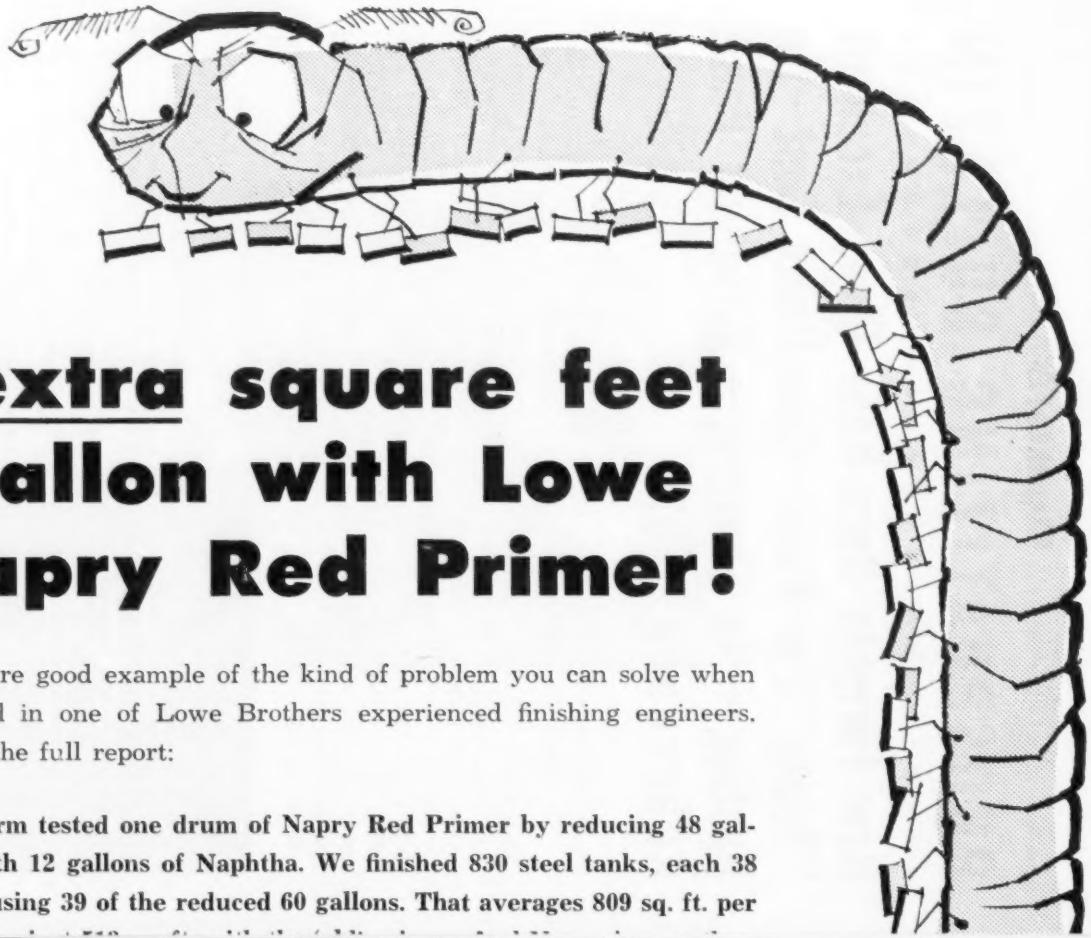

296 extra square feet per gallon with Lowe Napry Red Primer!

One more good example of the kind of problem you can solve when you call in one of Lowe Brothers experienced finishing engineers. Here's the full report:

"This firm tested one drum of Napry Red Primer by reducing 48 gallons with 12 gallons of Naphtha. We finished 830 steel tanks, each 38 sq. ft., using 39 of the reduced 60 gallons. That averages 809 sq. ft. per

Find out what a Lowe Brothers finishing engineer can do to help reduce your painting costs. Let him make a "flow-chart" analysis of your finishing system *without* obligation. Send the coupon right now.

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Dayton 2, Ohio

PF-9

☐ Please have my nearest Lowe Brothers Finishing Engineer call on me as soon as possible.

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TITLE_____

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Entrance to Wil-Son Infrared Baking Oven

to support a catwalk or an exhaust system.

Typical applications of this oven include drying army vehicles after finishing; baking paint on earth-moving machinery; and job-shop drying of lacquer on small parts after vacuum metalizing. The oven is said to be particularly suitable for processing large products.

Further data is available from Wil-Son Manufacturing Co., Cloverport, Kentucky.

For more data circle **21** on Reader Service Card

★ ★ ★

Rust Preventive

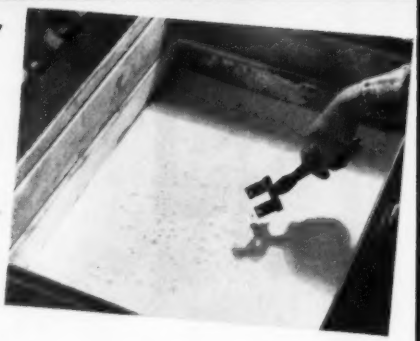
Heatbath Corporation has introduced a product called Rustgard, formulated to be used as a temporary rust preventive on ferrous metals.

FOR BETTER WEAR AND LONGER LIFE . . .

"Custom Coat"
SMALL PARTS
(IN ASSORTED COLORS)
WITH NYLON AND OTHER PLASTICS

This unique process, developed and patented in Germany, involves the use of a fluidized bed of finely divided powders. Such plastics as nylon can now be successfully coated on metal, ceramics and other materials.

Resistance to wear, low surface friction, anti-galling, or chemical and corrosive resistance—these are some of the benefits you may expect.



As licensees for this process, we are prepared to put this great new development in coating to work for you. Write or call us for additional information, at 2121 South 12th St., Allentown, Pa. Telephone HEmlock 4-9391.

LEHIGH RESEARCH & DEVELOPMENT CORP.
2121 So. Twelfth St. Allentown, Pa.

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Come Hell or High Water...

Sel-Rex Rectifiers remain in perfect operating condition!

"Our entire plant was covered by flood waters for three days. Although all our other equipment was badly damaged, our Sel-Rex Rectifiers remained in perfect operating condition"... reports Ken Moody, Secretary of Donham Craft Company, custom electroplater of Thomaston, Conn.

Now we don't recommend that you try to run Sel-Rex Rectifiers underwater... but this is just another example of the rugged dependability you get when you buy Sel-Rex.

Trouble-free performance under conditions where other equipment fails is only half the story... Sel-Rex also gives you rectification *custom-engineered* to your individual requirements, *at no premium in price.* Come hell or high water, you can't match Sel-Rex value and dependability.

Sel-Rex Rectifiers — 50 to 50,000 amperes — Germanium • Selenium • Silicon.

Complete catalog on request.

Rectifier Division

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Sel-Rex®

Manufacturers of Exclusive Precious Metals Processes, Metallic Power Rectifiers, Airborne Power Equipment, Liquid Clarification Filters, Metal Finishing Equipment and Supplies.
Offices: Detroit—Chicago—Los Angeles

For more data circle 397 on Reader Service Card

A water soluble material containing a powerful rust inhibitor, this material is mixed 1 to 20 parts with water and applied by immersion or spray at temperatures up to 212 deg. F.

It is used on ferrous metals to prevent rust after machining, stamping, drawing and forging; during assembly, storage and shipping; and as a final protective finish over conversion coatings such as black oxide and phosphate coatings.

Technical data on this material is available from the Heatbath Corp., Springfield 1, Mass.

For more data circle **22** on Reader Service Card

★ ★ ★

Cob Meal

Ti-Co Industries, Inc., Tipton, Indiana, has introduced cob meal products suitable for use in tumbling and soft grit blasting. These corn-cob products aid in cleaning, polishing, burnishing, deburring, descaling and drying operations.

The cob meal, available in various grit sizes, is said to be tough, durable, dust-free and absorbent.

Further data and samples are available from Ti-Co Industries, Inc., Box 185, Tipton, Indiana.

For more data circle **23** on Reader Service Card

★ ★ ★

Acid Inhibitor

Enthone, Inc., subsidiary of American Smelting and Refining Company, 442 Elm St., New Haven, Conn., has announced the development of an inhibitor for use in acid solutions. The product is known as Acid Inhibitor 11.

This inhibitor can be used on high carbon steel without danger of etching, the manufacturer states.

It is used at a concentration of

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ELECTROPLATING SOLUTIONS

Technological knowledge acquired through many years of experience, plus special processes and equipment, assure the high quality of our Rhodium Plating Solutions.

Recommended for contact surfaces of switches, waveguide parts and other electrical applications, such as printed circuits...Can be applied in extremely heavy deposits, up to 100 milligrams per square inch.

Rhodium plating provides the advantages of whiteness, lustre and corrosion resistance of a precious metal.

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Roto-Finish processes cut finishing costs, step up production

Savings on deburring, descaling, grinding, polishing, coloring and surface improvement by Roto-Finish barrel finishing processes are tremendous. Expensive hand finishing methods can be eliminated.

Roto-Finish Chips, Compounds and Machines are of the highest quality—Roto-Finish has never sacrificed quality for the sake of price. A continuous program of improvement of processes and products gives you better performance.

Roto-Finish guarantees results—There is no costly trial and error involved in the purchase of Roto-Finish equipment. You submit unfinished parts to Roto-Finish along with a finished sample and a description of the finish you require. These sample parts are processed by Roto-Finish to determine the right process to do the job. Roto-Finish guarantees to reproduce the same results in your plant, using Roto-Finish processes, that are achieved in sample processing.

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Roto-Finish COMPANY

3704 Milham Rd., Kalamazoo, Mich.

P. O. Box 988
Phone FI 3-5578

For more data circle 399 on Reader Service Card

about 0.2 per cent by volume and can be added to cold or hot sulfuric or muriatic acids, or to other non-oxidizing acids such as phosphoric, hydrofluoric, oxalic and citric acids.

Acid Inhibitor 11 has no odor and does not produce a foam on the acid solution. Acid-stable wetting agents such as Enthone Acid Addition Agent may be added to the same solution when a foam is desirable.

For more data circle **24** on Reader Service Card

★ ★ ★

Cyanide Purification Additive

The restoration of contaminated cyanide electroplating baths to trouble-free production is possible through the use of Pur-A-Salts, a product recently developed by Precious Metals Division, Sel-Rex Corporation, Dept. PF-10, Nutley, N. J.

This development is a patented formulation of barium double metal cyanides such as barium gold cyanide, barium silver cyanide, barium copper cyanide, or barium in combination with other cyanide electrolytes.

According to Sel-Rex's patent, Pur-A-Salts removes carbonates, sulfates, and chromates through preferential precipitation, depending on the solubility of these impurities. The precipitation is effected on a molar basis—three ounces of Silver Pur-A-Salts will remove one ounce of sulfate or carbonates, and will supply about 1.35 ounces of metallic silver. Thus the free cyanide content of the bath is undisturbed and impurities are removed, while other bath constituents are maintained at the desired ratios.

For more data circle **25** on Reader Service Card

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FROM **START**
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instant filtration
TO **FINISH**
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LSIN-20V

Models equipped with corrosive resistant alloys and materials for every electroplating and industrial solution from pH 0 to pH 14. Removes particles down to one micron in size.

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2292 Babylon Turnpike, Merrick, L.I., N.Y. MAyfair 3-4220

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Available in a variety of colors. Will match your sample.

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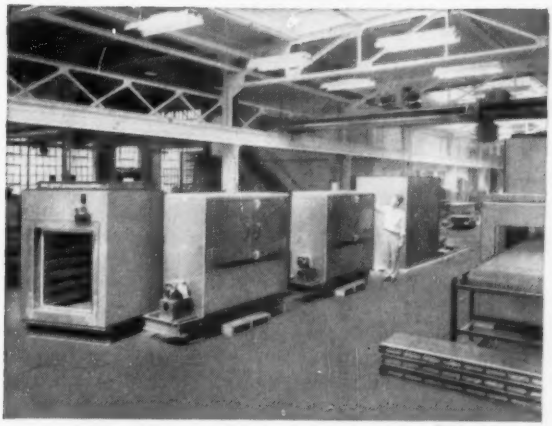
KIRK & BLUM Industrial Ovens



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Whatever your oven needs . . . large or small, batch or conveyorized production, for drying, baking or dehydrating . . . they can be filled by KIRK & BLUM.

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Many KIRK & BLUM Industrial Ovens, although designed and built to specifications, are shipped completely assembled and tested, ready to operate. Once "spotted" in your plant, they can be connected and in operation in a few hours, saving time, expense and confusion.

Illustrated is a representative group recently shipped to well known industrial firms.

KIRK & BLUM
INDUSTRIAL OVENS

For more data circle 402 on Reader Service Card

Thin Industrial Glove

An industrial glove recently introduced by the Pioneer Rubber Company, Willard, Ohio, is thinner than a surgeon's glove yet resistant to deterioration from corrosives.

Thin Glove

Made of vinyl Pylox (TM), "Nimble Fingers," as these gloves are called, are designed for jobs requiring finger sensitivity. This Pioneer model has unusually high non-allergenic properties, making it suitable for most persons allergic to rubber gloves, the manufacturer states.

"Nimble Fingers" are resistant to acids, alkalis, oils, greases and some solvents. The gloves are especially useful on jobs where the products being handled have to be protected from perspiration. Available in small, medium and large, they are 10½ inches long, with ample wrist protection.

For more data circle **26** on Reader Service Card

★ ★ ★

Forged Copper Anode

Chase Brass & Copper Co., Inc., Waterbury 20, Conn., has introduced a forged copper ball anode that is said to plate out rapidly and evenly, with a minimum of scrap loss.

This anode is 2 inches in diameter and weighs approximately 1½ pounds. Because it is cold forged, the anode is said to have a uniformly dense structure. The copper used in making these anodes is pure electrolytic copper.

For more data circle **27** on Reader Service Card

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CARLSTADT, N. J.

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DO YOU ALLOW RAPID WEAR
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when they can be *FUSECOATED* to last up to a year or more? We specialize in protective coatings for fixtures of all kinds and would like to add your name to our long list of regular customers.

Write
for our general information folder or send sample fixture or drawing of same to be FUSECOATED.

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Schaffner Bias Buffs

your answer for economical performance

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- FULLY VENTILATED
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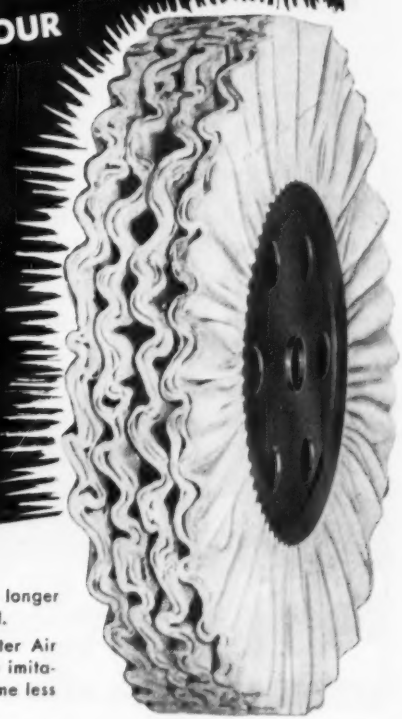

The buff you select is all important—it will mean longer buff life and greater production from a buff wheel.

Specify and buy the proven Schaffner Metal Center Air Cooled bias (type) Buff, and don't be satisfied with imitations. You'll find Schaffner buffs last longer, consume less compound and reduce rejections.

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For more data circle 405 on Reader Service Card

Steam Cleaning Equipment

Kelite Corporation has introduced several direct-fired Steam Cleaners.

The Mark I, designed for light to medium duty, has an output of 120 g.p.h. The Mark II, for medium to heavy duty, has a 200-g.p.h. output. The Mark III, with an output of 300 g.p.h., is designed for heavy duty. The output of all three Kelite Steam Cleaners is rated at 320 deg. F.

Each of the Kelite Steam Cleaners has a positive displacement piston pump capable of delivering its full rated output hundreds of feet from the machine; an efficient water-wall heat exchanger; and a gas or oil burner which provides instant starting.

Standard equipment on all Kelite Steam Cleaners includes one heavy-duty steam cleaning gun with swivel-type rear grip and a forward grip aerated to provide cool operation; a Hy-Vel (high velocity) spray nozzle; and a heavy-duty hose.

Kelite's recently introduced Steam Cleaner

Optional equipment includes nozzle control for all gas-fired models; trailer or caster mounting for all oil-fired models; flat nozzle and flat nozzle kit; and extra-heavy-duty wire-braid hose.

For further information, write Kelite Corporation, 81 Industrial Rd., Berkeley Heights, N. J.

For more data circle **28** on Reader Service Card

★ ★ ★

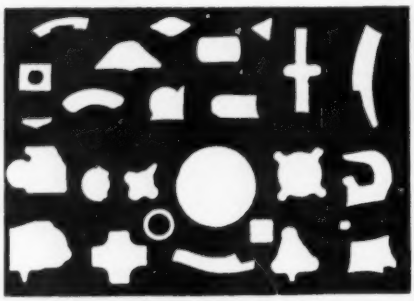
Aluminum Paint

A ready-mixed aluminum paint that air-dries in approximately three minutes with a minimum of smudging has been introduced by Alumatone Corporation, Los Angeles, Calif.

Designated Alumatone No. 100, the finish was developed for assembly lines requiring fast-drying paint films. Atmospheric conditions such as humidity and temperature do not affect drying time, the manufacturer states.

The product produces a tough, smudge-resistant finish with brilliance and tight adhesion to metals, plastics, glass, wood and rubber.

Alumatone No. 100 is formulated



Pre-Cut Masks Speed Finishing

Brady Pre-Cut Masks are self-sticking — go on fast and accurately. Protect from finishing to inspection. Hundreds of shapes and sizes in stock, for paint spraying, baking, tumbling, etc. Specials made to order. Fast delivery. Distributors in 150 cities.

Write for free samples and Bulletin 160-C.

W. H. Brady Co.

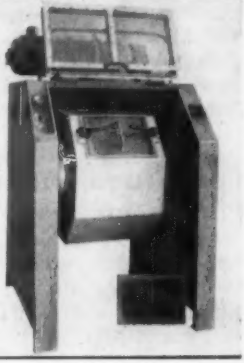
746 W. Glendale Ave., Milwaukee 9, Wis.

For more data circle **406** on Reader Service Card

for *fine* barrel finishing . . . the Abbott Method

Abbott Steel balls and shapes (size, inches)	
Abco BALLS	3/32, 1/8, 5/32, 3/16, 7/32, 1/4, 9/32, 5/16, 11/32, 3/8, 13/32, 7/16, 1/2, 9/16, 5/8.
Eclipse BALLS	3/32, 1/8, 5/32, 3/16, 7/32, 1/4, 5/16, 3/8, 1/2, 9/16, 5/8.
OVALBALLS	1/8, 3/16, 1/4, 5/16, 3/8.
BALLCONES	1/8, 3/16, 1/4, 5/16.
CONES	1/8, 3/16, 1/4, 5/16, 3/8, 1/2.
DIAGONALS	1/16, 3/32, 1/8, 5/32, 3/16, 7/32, 1/4.
PINS	1/4 x 9/32, 1/16 x 1/2, 1/8 x 3/8.

ABBOTT FINISHING BARRELS



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THE ABBOTT BALL COMPANY

1064 New Britain Ave., Hartford 10, Conn., U.S.A.

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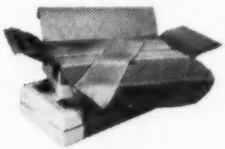
BOND TACK CLOTH

IN ROLLS

Cut off any size piece to use as needed.



IN BULK

Cut and folded. Ready to use.

STAYS SOFT AND TACKY — A SPECK-FREE FINISH EVERY TIME

Now Available In Rolls or Cut Bulk—White or Gold

In Four Different Types of Cloth

Get your Tack Cloth packed just the way it's easiest for you to use . . . either in 150 yard rolls of 36" wide cloth or in handy cartons . . . 100 or more Tack Cloths to the carton.

No matter which way you buy it, you can be sure that every square inch will stay SOFT and TACKY until the very last bit is used up! Choice of Standard, Extra Tacky or Less Tacky, as desired.

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from synthetic thermosplastic resins and 325-mesh aluminum pigment. It is stabilized to prevent discoloration during storage.

For more data circle **29** on Reader Service Card

★ ★ ★

Centrifugal-Action Paint Gun

A recently introduced paint gun "slings" paint, rather than propells it to the surface with air. This centrifugal-action gun is said to reduce overspray and fogging.

The heart of this paint gun (called the "Rogers Rotary") is a nylon worm gear that force-feeds paint or other material to be sprayed up through a hollow stem to spinning rotors that sling the liquid out gate-like openings. The pattern produced ranges from one-quarter to twelve inches in width. A Westinghouse motor powers the unit at speeds of 5, 10, or 15 r.p.m.

A miniature trap-door covering the bottom of the hollow stem controls the rate of flow of paint drawn up from the screw-on quart container. The entire unit weighs slightly over three pounds.

This UL-approved paint gun is in use for maintenance, stenciling, light oil applications, laboratory testing and other uses. The gun is manufactured by Martin Stove and Range Company, and it is marketed nationally by Napco, Inc., 3473 Fairmount Blvd., Cleveland 18, Ohio.

Cutaway photograph of the Rogers Rotary Centrifugal Painting Gun: it slings the paint

For more data circle **30** on Reader Service Card

★ ★ ★

Corrosion-Protective Paint System

A two-coat paint system that is said to give excellent protection from corrosion has been announced by The Arco Company, Cleveland, Ohio.

This paint system was originated specifically for use on air conditioning equipment and components. It has been accepted by Underwriter's Laboratories, Inc., for use on exterior steel enclosures of air conditioning equipment.

The coating is also suitable for use

LAZO Offers Complete Line of Performance Proven Plating Barrels

. . . from Largest down to the Smallest

NEW "MINIM" Plating Barrel (illustrated)

Portable, motorized. Handles parts up to 1" dia. All plating solutions. Holds 5 oz. to 2 lbs. 1/16" perforations. No basket. Lucite barrel. Single phase, gearhead motor of 110-v., 60 cycles. Overall size 9 x 7 x 17" high. (Pat. Pending).

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HARDWOOD LINE MFG. CO., 2022 N. California Ave., Chicago 47, Ill.

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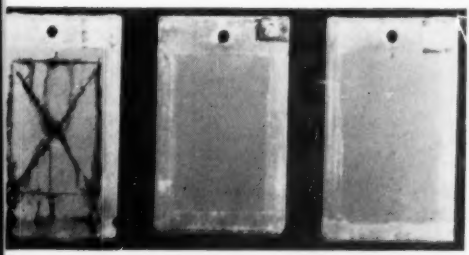

Three steel panels above have been finished with Arco two-coat paint system. Panels have been exposed to a salt fog from a 20 per cent saline solution for a total of 2640 hours, an extreme exposure in comparison with the 500-hour tests considered "severe" by most evaluators. Panel on the left was mechanically scored to bare metal. These panels were tested by Underwriters' Laboratories, Inc.

on many other steel fabrications where appearance and durability are desired. Its use is limited only by the fact that this system requires baking.

Claims for durability of this Arco paint system, the manufacturer states, are based on outstanding performance in tests of extreme severity, running as much as 5 times the length of conventional "severe" tests. Particularly in corrosive coastal atmospheres and industrial atmospheres, Arco's paint gives excellent performance. The coatings are also characterized by good color retention in outdoor exposure.

A single bake is used for this two-coat spray system. Separate baking for the primer is optional, as is flow-coat primer application.

Technical bulletin covering this paint system is available from The Arco Company, 7301 Bessemer Ave., Cleveland 27, Ohio. Write on company letterhead.

For more data circle **31** on Reader Service Card

★ ★ ★

Electroless Gold

Metal Processing Company has introduced an electroless gold plating

have your silk screens made by **NAZ-DAR!**

Silk, Nylon or Metal Cloth

- Prompt Delivery anywhere in U. S.
- Absolutely TAUT screens for perfect registry to last impression of run.
- Perfect reproduction of your black and white drawing.
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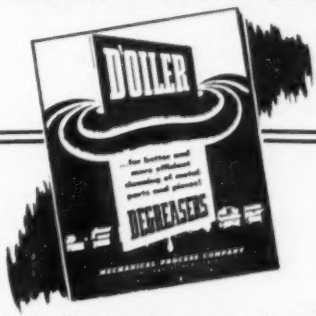

Contains all types of degreasers: Laboratory, Two-Dip, Three-Dip, Vapor Spray, Barrel Type, Automatic, Semi-Automatic, Driers, Stills and Specials.
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mechanical process co., inc.
392 VALLEY ST. • SOUTH ORANGE, N. J.

For more data circle **411** on Reader Service Card

process called Lustralloy-G. This coating was developed primarily for use on electroless nickel.

The gold deposition is continuous. The bath deposits gold at about 0.0324g/sq. in./hr.

On a polished nickel surface the gold is bright and adhesion is excellent. The deposit is tarnish-resistant and, for equivalent total plate thickness, preliminary tests indicate, the manufacturer states, that salt spray results are as good as those of electrodeposited gold.

While complete metallurgical data is not available, the process is considered to be practical enough so that it can be applied where thin deposits are desired. Literature may be obtained by writing to Metal Processing Co., Cedar Grove (Essex County), N. J.

For more data circle **32** on Reader Service Card

★ ★ ★

Barrel Lift

A barrel lift that is helpful in raising, transporting, rotating, tilting and draining drums has been introduced by Morse Manufacturing Co., Inc., 762 W. Manlius St., East Syracuse, New York.

This device can be operated by one man. All operations can be performed without undue strain on the operator. Self-locking safety stops prevent accidental movement of the handle.

Morse One-Man Barrel Lift: does five jobs

Tilt locks secure the drum in a vertical position while loading and in a horizontal position while draining. The drum returns to the vertical position after draining. Patented features reduce spillage, overflow, leakage, and drum damage. The Morse Barrel Lift will handle drums up to 1,000 pounds in weight.

For more data circle **33** on Reader Service Card

★ ★ ★

Fluid Pressure Regulator

A diaphragm-type fluid pressure regulator that is said to eliminate plugging, clogging and material build-

VINYL **PLASTISOL** COATINGS
* APPROVED SOURCE
• MATERIAL HANDLING—TOUGH • DURABLE • NOT AFFECTED BY TRICHLOR.
• TUMBLING BARRELS—INEXPENSIVE • SEAMLESS • LONG LIFE LININGS
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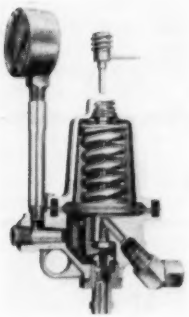
FOR FURTHER INFORMATION: MARATHON METAL PRODUCTS, INC.
20 FRONT ST. MARATHON, N. Y.

For more data circle **412** on Reader Service Card



Cutaway View: Graco Fluid Pressure Regulator

up has been announced by Gray Company, Inc., Minneapolis, Minnesota.

This Graco Uni-Flo regulator provides positive control of all fluid pressures without surge or variation in fluid-supply lines, the manufacturer states.

The Mylar polyester diaphragm used in this control is impervious to all known solvents. It permanently separates the fluid chamber from the control mechanism.

The blow-back valve is simple to operate. It allows flushing at any time, without changing pressure setting.

Three models of this Graco Uni-Flo regulator are available. They control all fluid pressures from fractions of a pound up to and including 160 p.s.i.

For further information, write Gray Co., Inc., 1001 Sibley St., N.E., Minneapolis 13, Minn.

For more data circle **34** on Reader Service Card

★ ★ ★

Compact Steam Cleaner

A compact steam cleaner has been announced by the Clayton Manufacturing Company, El Monte, California. Called the Clayton-Kerrick 60 "Handyman" Steam Cleaner, it has a 60-gallon capacity. It's suitable for light-duty general utility cleaning.

The "60" is a self-contained unit. Operating on any water pressure, it requires no auxiliary pump.

Thermal efficiency is said to be in excess of 65 per cent in Model 60.

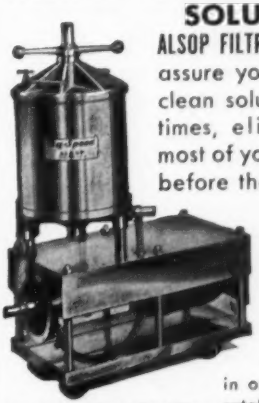
A brochure describing the Clayton-Kerrick Handyman "60" may be had by addressing the Clayton Manufacturing Company, P. O. Box 550, El Monte, Calif.

Clayton-Kerrick "Handyman" Steam Cleaner

For more data circle **35** on Reader Service Card

LESS REJECTS . . . WITH A TOTALLY CLEAN SOLUTION!

ALSOP FILTRATION UNITS assure you a totally clean solution at all times, eliminating most of your troubles before they start.



★

The ultimate in filtration is described in our FREE NEW catalog—it's yours for the asking.

ALSOP ENGINEERING CORP.

1209 Keen Street Milldale, Connecticut

For more data circle **413** on Reader Service Card

News of the Industry

New plants . . . company news . . .
new positions . . . meetings . . . necrology . . .

NEW PLANTS

Opening of a new branch office and warehouse in Cincinnati, Ohio, has been announced by **Minnesota Mining & Manufacturing Co.**

The new facilities are part of 3M's program to extend and improve service to customers in this area, according to Branch Office Manager R. H. Vieth.

The two-story structure is located at 4835 Para Drive.

3M manufactures more than 300 varieties of "Scotch" Brand pressure-sensitive tapes, coated abrasives, adhesives and coatings, electrical insulating products, magnetic recording tapes, roofing granules, reflective sheeting, printing products, decorative ribbon, chemicals, office copying equipment, and reinforced plastic sheeting and pipe.

Minnesota Mining has also opened a new branch office and warehouse in Cleveland, Ohio.

The building is at 12200 Brookpark Rd. It has 70,000 square feet of floor space, about double the space in 3M's previous facilities.

★ ★ ★

W. P. Fuller & Co., large western paint manufacturer, has opened an extensive new general research laboratory in South San Francisco.

The ultra-modern scientific workshop will be devoted primarily to research and development of new products.

W. P. Fuller Brawner, president of the company, officiated at the opening of the new facility, which will serve as research headquarters for three other Fuller laboratories maintained on the West Coast.

COMPANIES

The DeVilbiss Company has announced an agreement to purchase the **Newcomb-Detroit Company,** a pioneer in the design, manufacture and installation of custom-built industrial finishing equipment.

Describing the acquisition as a move which will strengthen both companies, Howard P. DeVilbiss, president of DeVilbiss, said Newcomb-Detroit will remain a corporate entity and be operated as a subsidiary of DeVilbiss.

By means of the move, DeVilbiss acquires additional manufacturing facilities in Detroit and Grand Rapids, Michigan, important research facilities and specialized sales and engineering staffs which will be combined with those of the parent company.

Newcomb-Detroit designs, manufactures and installs industrial ovens, heavy-duty water wash spray booths, parts washers, dust collectors and a wide variety of kindred equipment, metal-cleaning and rustproofing ma-

chines, pickling units, dip systems, continuous or intermittent conveying systems, flow coaters and replacement air systems. In addition to custom installations, the company also furnishes individual units.

These products supplement and complement the DeVilbiss line of spray-painting and finishing equipment for industry and will henceforth be marketed through DeVilbiss' international sales organization.

★ ★ ★

The **Mexico Refractories Company of Texas** has been named distributor of **Pennsalt Chemicals Corporation's** Corrosion Engineering products in Texas, southern Arkansas, and western Louisiana. Headed by General Manager L. L. Brightman, the company's main office and warehouses are at 2211 Walker Ave., Houston.

In addition to handling Pennsalt's corrosion-resistant mortars and protective coatings, Mexico Refractories will carry local stocks of companion products, including acid-resisting brick.

★ ★ ★

Franklin T. Andrews, president of **North American Industrial Engineers, Inc.,** Los Angeles, has announced the formation of Manufacturers' Service, Inc. The company is equipped for barrel finishing parts on a job basis. The plant is at 2210 Chico Ave., El Monte, Calif.

The firm will also handle B.M.T. Multi-Barrel slide honing machinery, and Lakeseal Organ-Tu universal tumbling compounds. Abrasives and barrel finishing compounds will also be distributed.

Alan J. Bronold is president; **Paul M. Maurer,** vice-president; **Joseph B. Hyde, Jr.,** secretary-treasurer; **William A. Barbeau,** general manager; and **Francis J. Dino** is the factory manager.

★ ★ ★

Al Korbelak, sales manager of **Sel-Rex Corporation's** Precious Metals Division, has been granted a patent covering a method and apparatus for the manufacture of uniform-thick, ultra-fine wire. Utilizing an electrolytic method which, the patent claims, affords uniform diameter and eliminates strand breakage during conventional reduction, the method and apparatus was invented jointly by Mr. Korbelak and Clair M. Rively, while both were employees of the Westinghouse Electric Corporation, to which concern the patent has been assigned.

Al Korbelak

★ ★ ★

Heatbath Corporation recently conducted a three-day sales meeting in Chicago. Direct sales representatives from midwestern areas were in Chicago for the sales meeting, which included a tour through new and expanded manufacturing facilities at the Chicago plant.

Heatbath sales personnel who recently attended meeting in Chicago. Back row, left to right: D. R. Barber, general manager; J. B. Wheeler, Indianapolis; E. A. Walen, Jr., vice president; R. Shepard, Chicago; G. P. Ott, Cleveland. Front row (l. to r.), B. Ifkovits, Chicago plant manager; M. A. Focht, Chicago; J. C. Drinkwater, Detroit; G. Nick, Chicago.

The new garage and neighboring service building of the **Dayton Power and Light Company** includes complete spray painting facilities.

The new buildings, with their space for these departments, have made it possible for DP&L to handle its refinishing jobs quickly and efficiently.

Two truck-painting booths in the garage, for instance, make it possible for the company to care for its own 650-vehicle fleet. The refinishing and touch-up required to keep the vehicles new-looking and attractive are handled in one booth. Three to four complete refinishing jobs are done each week, accounting for about 85 per cent of the work done in this booth. The other 15 per cent is in touch-up.

The other booth is devoted to applying Spray Glaze to keep the trucks and cars bright and shiny. This booth turns out two vehicles a day. Both booths were installed by the **DeVilbiss Company.**

Since DP&L covers 24 counties around Dayton, scheduling vehicles for regular maintenance, as well as painting or polishing, requires planning. This is handled by traveling maintenance men who periodically check every company car and truck outside the Dayton area and, working with the garage supervisor, schedule them for repair, painting or touch-ups.

These two cranes lifting a section of a 65-foot, 72,000 pound automatic plating machine, played a major role in installation procedures upon arrival recently of the giant machine at Stanley Hardware, division of The Stanley Works, New Britain, Conn. Built by Wagner Brothers Inc., Detroit, the plating machine was delivered in three sections, lifted five stories and "pushed" through a special opening in the plant wall, with only inches to spare. The new machine will be used to bronze-plate hinges, cabinet-hardware and other products. It includes a conveyor system of 72 racks for parts to allow plating at a rate of 100 racks per hour.

Four booths using the same type of DeVilbiss equipment are in the service building. In two of them, all electrical transformers and meters coming in for repair are sprayed with a long oil, slow-drying paint. Spray has replaced brush work here because of its greater efficiency in covering the transformers, which are frequently of irregular shape and size. Any idle time in these booths is used for painting office equipment and other maintenance jobs.

Another booth is used for spraying

SPRAY MASKS
REDUCE YOUR MASKING COSTS BY USING INEXPENSIVE, HEAT RESISTANT
KWIKY-DOTS
A raised edge is automatically provided on each disc for easy grasping. Connected strings of several discs may be removed for fast application. Stock Sizes—⅛" up.
DIE-CUT MASKS, CAPS & PLUGS MADE TO SPECIFICATIONS
Special width of masking tape precision cut to any size from 1/32" up to 9" in standard 60 yard rolls.
BY-BUK COMPANY
4314 W. Pico Blvd., Los Angeles 19, Cal.
For more data circle **414** on Reader Service Card

quick-drying aluminum paint on gas meters, while the fourth is used to spray quick-drying enamel on electric meters.

★ ★ ★

Ray G. Johnson, sales manager of the laundry chemicals department, **James H. Manning,** sales manager of the food sanitation department and **Carl C. Clabaugh,** manager of the metal finishing chemicals department of **Cowles Chemical Company,** Cleveland, Ohio, joined over 300 sales and marketing executives from all over the world to participate in the intensive Executive Development program of the 5th Annual Graduate School of Sales Management and Marketing, sponsored annually on the campus of Rutgers University by National Sales Executives, Inc., a 28,000-member world organization for marketing management.

These three men attended the school last summer and are going back this year to complete the two-year course. This famed Graduate School helps prepare men to meet and overcome the complex problems of modern distribution. At the completion of the course, diplomas are issued jointly by NSE and Rutgers University. The faculty of the school is composed of a distinguished group of university professors and prominent industry leaders.

★ ★ ★

Ford Motor Company has adopted a water-emulsion "safety" paint containing no flammable or fume-producing thinners, for use on automotive parts.

D. J. Davis, vice president of manufacturing, said that the water-based paint is an important milestone in the automobile industry, since it contributes significantly to safer working conditions.

The emulsion paint is the result of two years of research by Ford's process development department, in cooperation with the company's paint suppliers.

First applications of the new material were made at Ford's frame plant and standard transmission and radiator plant in Dearborn and at the Monroe, Mich., parts plant.

Mr. Davis explained that the nonsolvent paint consists of particles of pigment or protective substance suspended in water rather than dissolved in a volatile thinner. Since it contains no solvents, the paint does not emit flammable fumes.

"While water-emulsion paints have existed for several years, extensive research was required to perfect a product with exterior durability that was adaptable to high-volume production conditions. A foaming problem was especially difficult to overcome," Mr. Davis stated.

Humidity and exposure tests indicate that the water-emulsion paint equals the durability of previously used materials.

"Studies are continuing to develop more water-emulsion paints with the special characteristics needed to produce quality automotive parts. The

QUALITY EQUIPMENT

PRICED RIGHT AND READY FOR IMMEDIATE SHIPMENT

BUFFING AND POLISHING EQUIPMENT

100 Hammond—Divine—U. S. Electric—Holland — Standard Electric — L'Hommedieu single speed and variable speed buffing and polishing machines. 1 to 20 HP.

6 Rotary Machines: Hammond—Acme—Packermatic.

Complete buffing systems for above machines, including hoods, cyclones, dust boxes, pipes, motors and blowers; various sizes.

Semi-automatic machines: Buffalo—Hammond Acme—Divine—Production.

ALL EQUIPMENT IN STOCK INSPECTION INVITED

all quoted subject to prior sale.

J. HOLLAND & SONS, INC.

485 KEAP ST., B'KLYN, N. Y., STagg 2-2022

For more data circle **415** on Reader Service Card

outlook is promising for expanding the use of water-emulsion paints to more Ford manufacturing operations," Mr. Davis said.

★ ★ ★

Octagon Process, Inc., Staten Island, N. Y., has announced the appointment of the **W. D. Forbes Company** of 129 Sixth Ave., Minneapolis, Minn., as distributor in Minnesota.

Forbes will carry all of the Octagon specialty chemical lines, including cold and hot metal cleaners, safety solvents, paint strippers, carbon and rust removers, rust preventive oils, bright dips and phosphatizing compounds.

★ ★ ★

Murray-Way Corporation, Birmingham, Michigan, has appointed as distributor **Giebel, Inc.**, of New York, and New Haven, Conn.

This well-known Eastern distributing firm, headed by Robert L. Giebel, has been prominent in the machine tool field since 1932 and at present has eight salesmen covering Connecticut, northern New Jersey and southeastern New York State, with offices at 250 W. 57th St., New York City, and 152 Temple St., New Haven, Connecticut.

★ ★ ★

The industrial advertising program of **Minnesota Mining and Manufacturing Co.**, St. Paul, Minn., on behalf of its line of coated abrasive "PG" wheels was among the top five honor awards recently announced by the National Industrial Advertisers Association in New York City.

J. H. Gustafson (left) advertising manager for the Coated Abrasive and Related Products division, and C. L. Murphy, manager of the division's industrial trades group, hold the award recently presented to Minnesota Mining and Manufacturing Co., St. Paul, by the National Industrial Advertisers Association. The award cited the company for its advertising campaign which introduced the "PG" (polishing and grinding) wheel.

Created to introduce the firm's new polishing and grinding wheels, which are composed of hundreds of coated abrasive leaves, the "PG" wheel campaign was planned to include direct mail and news releases as well as advertising in national magazines.

The program was conceived by the

Thompson Fast-Dry Production Primers can be used on any clean steel surface . . . you can topcoat them in just a few minutes . . . and they give you excellent adhesion and corrosion-resistance. These superior primers come in five colors and white. Write for literature, including technical data.

Industrial Finishes Since 1847

THOMPSON and COMPANY
1010 ALLEGHENY AVE., OAKMONT, PA.

For more data circle **416** on Reader Service Card

advertising department of the 3M Company in cooperation with Batton, Barton, Durstine and Osborn, the firm's advertising agency. C. O. Moosbrugger is the 3M director of advertising; J. H. Gustafson is advertising manager for the firm's Coated Abrasives and Related Products division; and Alan Shearer is the account executive representing the advertising agency.

NEW POSITIONS

Kenneth B. Sharpe, vice president and general manager of **Sharpe Manufacturing Co.**, Los Angeles, has announced the expansion of the company's sales staff.

L. D. McClure will cover northern California, Oregon and Washington. **Joe Crawford, Jr.**, will call on customers in the northwest central and southwest central states. **Harry Franklin, Jr.**, has been reassigned to the main office in Los Angeles, and will cover southern California and Arizona. All sales activities continue to be supervised by Riley Jones, sales manager.

★ ★ ★

Thomas Atkins has been appointed sales supervisor, Coated Abrasives Division, **Armour and Company**, Alliance, Ohio. He will supervise sales in northern Illinois, selling both industrial coated abrasives and retail Handy Home Products. The latter includes retail sandpaper, glues, hand sanders, and masking tape.

★ ★ ★

Hanson-Van Winkle-Munning Co. has announced the appointment of **Henry B. Koehler** as electrical sales engineer.

In this capacity Mr. Koehler will concentrate on the engineering and sale of motor generator equipment for the metalfinishing industry. His appointment follows completion of an intensive training program in electroplating and allied processes at H-VW-M's main plant.

J. C. Smith

Henry B. Koehler

J. C. Smith has been appointed plant manager of the Bowling Green, Ky., plant of **Detrex Chemical Industries, Inc.**

Mr. Smith has been with the Detrex organization for eleven years in various positions in the engineering department. His most recent assignment was chief engineer of the Drycleaning Division.

For Platers, Silversmiths, Jewelry Mfgrs., Makers of Watches, Clocks and Electronics and other metal finishers.
Supplied in straight or crimped brass, steel, nickel silver or stainless steel wire in sizes .0025 to .006 and in bristle, fibre or Nylon. Special sizes and shapes to order.
Write (Dept. P) on your letterhead for catalog and price list

DIXON & RIPPEL, INC. Box 776 Saugerties, N. Y.
ESTABLISHED 1856

For more data circle **417** on Reader Service Card

Klem Chemicals, Inc., Dearborn, Michigan, has announced the appointment of **Thomas C. Wilson** as sales engineer in the Cleveland territory. His headquarters will be the Cleveland office, Euclid Building, Cleveland, Ohio.

★ ★ ★

Francis P. Flitner has been appointed manager of the San Jose, California, branch of **The DeVilbiss Company.**

Mr. Flitner joined the company as a sales representative in 1947 and became divisional sales engineer in 1951. His entire career with the company has been spent in the West Coast area.

★ ★ ★

Charles W. Ostrander has been appointed technical director of **Allied Research Products, Inc.,** Baltimore, Maryland, manufacturer of Iridite chromate conversion coatings and ARP plating chemicals.

Raymond Stricklen has been named laboratory director of the company's Development Laboratory.

★ ★ ★

Stanley S. Krentel, vice-president of **MacDermid Western,** has been named executive vice-president of **MacDermid Incorporated.** Mr. Krentel will continue to operate from the MacDermid Western office and plant in Ferndale, Michigan. He is a member of the Detroit Branch of the American Electroplaters' Society.

MORSE
VERTICAL DRUM TRUCK
ROCK-A-DRUM

Picks up 55 gal. drums, rolls them over for side draining. Becomes a rugged stand on 3" wheels.

MORSE MFG. CO., INC. 762 W. Manlius St. East Syracuse, N.Y.

For more data circle 418 on Reader Service Card

Stanley S. Krentel

S. S. Wilson

S. S. Wilson has been appointed executive vice president and general sales manager of the **Sel-Rex Corporation,** manufacturer of plating equipment and supplies.

Mr. Wilson's offices will be in the firm's new office building at 75 River Rd., Nutley 10, N. J.

★ ★ ★

Enthone, Inc., New Haven, Conn., a subsidiary of American Smelting & Refining Co., has announced several changes and additions to its staff.

J. F. Buckman, former executive vice-president, and one of the original founders of Enthone, Inc., retired from active service on May 29.

Edward F. Foley, Jr., formerly research chemist, has been appointed production manager and purchasing agent for the New Haven plant.

Lawrence J. Durney, formerly research chemist, has been appointed manager of product development.

William K. Murray, technical service engineer with Enthone, Inc., since 1953, has been appointed manager of technical service.

Albert J. Kolb and **Gordon G. Menzies,** formerly laboratory technicians at Pratt & Whitney, Div. United Aircraft Corp., have joined the technical service staff of Enthone, Inc.

Harriett Ciaburro has become control chemist in the Technical Service Laboratory.

John L. Morico, formerly biochemist with the U. S. Army Surgical Research Unit, has joined the Development Department staff as development technician.

★ ★ ★

Hanson-Van Winkle-Munning Co., manufacturer of electroplating processes, equipment and supplies, has announced the appointment of **George W. Stone** as controller.

With 16 years' experience in accounting, auditing, taxes and cost accounting functions, Mr. Stone was formerly general accounting manager at Allen B. DuMont Laboratories, Inc., Clifton, N. J. He was responsible for all general accounting functions of the parent company and five subsidiaries.

★ ★ ★

Connecticut Filter Corporation, a division of **Cuno Engineering Corporation,** Meriden, Connecticut, has appointed **John E. McKay** regional manager of Distributor Sales.

In his new job, Mr. McKay will have responsibility for sales of Cuno Micro-Klean filters and cartridges through distributors and will work in the field with distributors.

Cuno has also appointed two new sales representatives for the Indiana and Ohio area. They are **John R. Carlson Co.,** 4808 Broadway, Indianapolis and **E. C. George Company,** 2412 Far Hills Ave., Dayton, Ohio.

George Whorf has been appointed manager of Cuno's new Cincinnati branch office at 2007 Madison Road.

Mr. Whorf has been a sales engineer for the past three years in Cuno's home office.

★ ★ ★

Francis X. Bergin has been appointed product manager for **The Lea Mfg. Co.** He will be in charge of all sales and service on liquid abrasive compounds for polishing, buffing and burring, and related spray buffing equipment, for both Lea of Waterbury and Lea of Michigan.

V. B. Chamberlain, Jr.

Francis X. Bergin

Valentine B. Chamberlain, Jr., has been appointed sales manager of **The Stanley Chemical Company,** a subsidiary of The Stanley Works, East Berlin, Conn., succeeding Arthur B. Sherry, who resigned.

Mr. Chamberlain, who joined The Stanley Works in 1941, has been assistant sales manager in charge of national accounts.

★ ★ ★

H. I. Allen has been promoted to head of the technical service group of **Oronite Chemical Company's** Marketing Department, succeeding **M. P. Youker,** who was recently promoted to assistant manager, Western Export.

Thomas J. Shea has been employed as a sales representative for Oronite Chemical Company. He is assigned to the New York Region.

"GRIPALLOY"

. . . Attractive satin sheen primer in black and colors . . .
. . . Amazing tight adhesion to 25 different metals as reported by a large electrical manufacturer . . .
. . . Excellent resistance to Salt Spray, Gasoline and Solvents.

TENAX, Newark, N. J.
Lacquers—Enamels
Synthetics—Varnishes

For more data circle 419 on Reader Service Card

Chemical Products Corporation has announced the appointments of **Joseph S. Hawes** as vice-president in charge of lacquer sales, and of **Hugh B. Allison** as vice-president in charge of Chem-o-sol sales.

★ ★ ★

A. G. Buschow has been appointed vice president and chief engineer of **Bart Laboratories & Design, Inc.**

Mr. Buschow has been associated with the Bart operations since 1944. His duties have included the design and supervision of construction of both large and small plating plants. Other responsibilities have been the development and design of high-speed plating machines for electroforming.

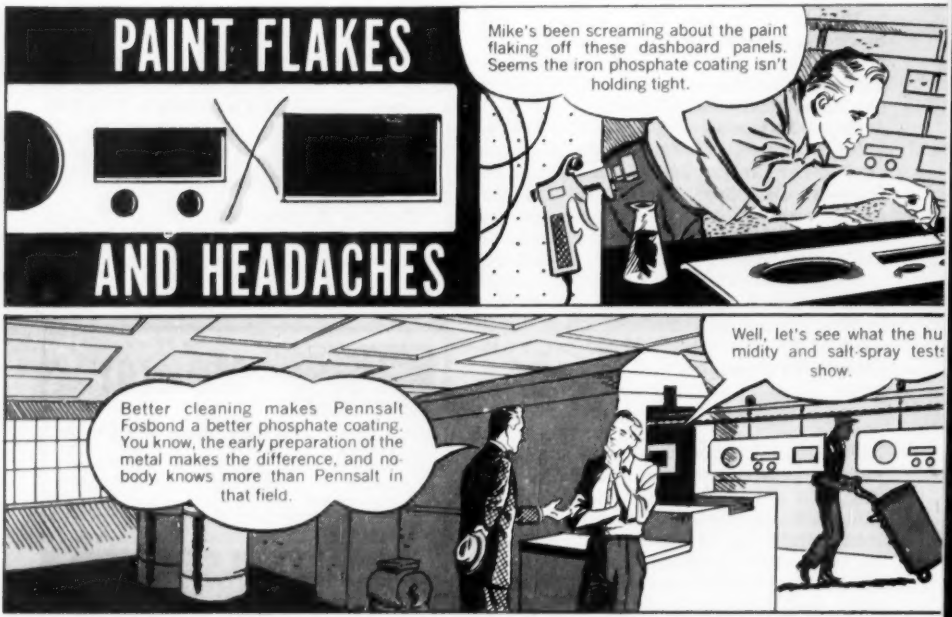
Dr. Dodd S. Carr has been appointed director of research for **Bart Laboratories & Design, Inc.**, Belleville 9, New Jersey.

In 1952 Dr. Carr became assistant director of electrochemical research for the Bart Manufacturing Corporation. He developed hard nickel coatings for propeller blades and directed research on electroforming, high temperature protective coatings, and welding of nickel-plated steel pipe, fittings, and plate.

Dr. Carr is chairman of the national Electroplating Course Committee of the American Electroplaters' Society and is second vice president of the Newark Branch.

A. G. Buschow

Dr. Dodd S. Carr


PAINT FLAKES
AND HEADACHES
Mike's been screaming about the paint flaking off these dashboard panels. Seems the iron phosphate coating isn't holding tight.
Better cleaning makes Pennsalt Fosbond a better phosphate coating. You know, the early preparation of the metal makes the difference, and nobody knows more than Pennsalt in that field.
Well, let's see what the humidity and salt-spray tests show.

Allied Research Products, Incorporated, Baltimore manufacturer of the Iridite line of chromate conversion coatings and ARP plating chemicals, has announced the following appointments to its sales organization: **William F. Cahill** is the new distributor for Maine, New Hampshire, Vermont, Rhode Island and Massachusetts from headquarters at Providence, Rhode Island; **Roger Fenwick** has been transferred to Cleveland. He will work in western Pennsylvania and northeastern Ohio.

★ ★ ★

Cyrus P. Olsen has joined the Versatal Materials Handling Equipment section of the Alemite Industrial Sales division of **Stewart-Warner Corporation** as field specialist in systems for paint finishes application.

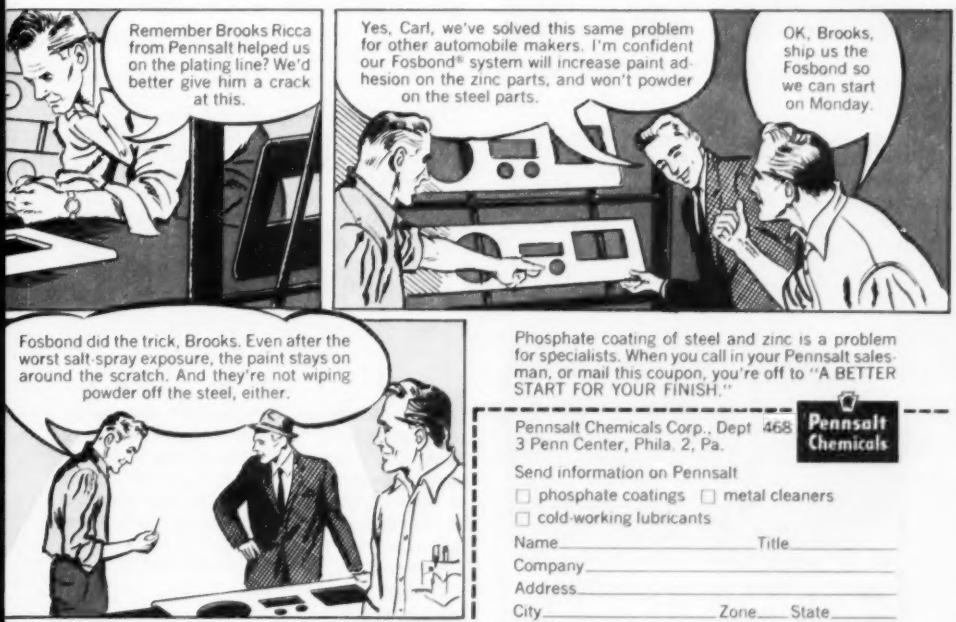
Mr. Olsen will work with Alemite distributors and jobbers throughout the country in sales of the new series of Versatal Paint pumps announced by the Alemite Division earlier this year.

Charles D. Coxe

Cyrus P. Olsen

Handy & Harman, manufacturers and refiners of precious metals and alloys, has announced the appointment of **Charles D. Coxe** as manager, Metallurgical Department.

His responsibilities will include operation of the company's technical and assay laboratories, technical control in plants and powdered metal products manufacturing.


Remember Brooks Ricca from Pennsalt helped us on the plating line? We'd better give him a crack at this.
Yes, Carl, we've solved this same problem for other automobile makers. I'm confident our Fosbond® system will increase paint adhesion on the zinc parts, and won't powder on the steel parts.
OK, Brooks, ship us the Fosbond so we can start on Monday.
Fosbond did the trick, Brooks. Even after the worst salt-spray exposure, the paint stays on around the scratch. And they're not wiping powder off the steel, either.

Phosphate coating of steel and zinc is a problem for specialists. When you call in your Pennsalt salesman, or mail this coupon, you're off to "A BETTER START FOR YOUR FINISH."

Pennsalt Chemicals

Pennsalt Chemicals Corp., Dept 468
3 Penn Center, Phila. 2, Pa.

Send information on Pennsalt

☐ phosphate coatings ☐ metal cleaners
☐ cold-working lubricants

Name_____ Title_____
Company_____
Address_____
City_____ Zone____ State_____

For more data circle 420 on Reader Service Card

Walter W. Tesch has been appointed a sales representative for **The Stanley Chemical Company,** a subsidiary of The Stanley Works, East Berlin, Conn.

Mr. Tesch will represent Stanley Chemical in southern New Jersey, southeastern Pennsylvania and greater Philadelphia. He joined the company as a sales trainee in June. He was formerly employed by The U. S. Rubber Company as a physical test supervisor in its control laboratory.

Michigan Chrome & Chemical Company has announced the appointment of **Chuck Fossati** as sales representative for northern Ohio, western New York, western Pennsylvania and Canadian provinces.

Mr. Fossati entered the Chemical Division's Sales Training Program early in 1956. He will headquarter in the Buffalo, New York, area and be responsible for sales of Miccrosol and Miccro Products.

A. S. Ault

Walter W. Tesch

C. Fossati

Howard R. Hutchinson

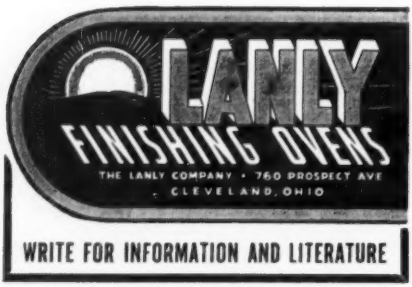
A. S. Ault, vice president-sales of **Chicago Vitreous Corporation,** a division of The Eagle-Picher Co., Cicero, Illinois, manager of porcelain enamel frit, has been promoted to general manager of the entire company, according to an announcement by William Hogenson, president.

Howard R. Hutchinson has been assigned by **Better Finishes & Coatings, Inc.,** 268 Doremus Avenue, Newark 5, New Jersey, as sales representative for the Connecticut, Long Island and metropolitan New York areas for that company's line of industrial finishes, architectural and maintenance paints and strippable coatings.

★ ★ ★

Fred B. Davis, production manager and manager of **Cowles Chemical Company's** Lockport, New York, plant has retired after more than 50 years of service. He will be succeeded by **N. E. Woonton,** recently elected vice president of manufacturing.

Robert H. Frank, superintendent, assumed Mr. Davis' duties at the Lockport plant on June 1.



For more data circle **421** on Reader Service Card

J. S. McCulloch, Jr., of Baltimore, Maryland, is the newly appointed representative for **H. N. Hartwell & Son, Inc.,** Boston, Massachusetts. He will be Hartwell's exclusive agent in New Jersey, eastern Pennsylvania, Delaware, Maryland and Virginia.

The Hartwell Company distributes unplasticizied PVC materials manufactured by The Bolta Company, a Division of the General Tire & Rubber Company, Lawrence, Mass.

★ ★ ★

The appointment of **Stuart W. Rodger** to the newly created post of industrial trade sales manager has been announced by Howard McAleer, president of **Formax Manufacturing Corp.,** Detroit.

In his new capacity, Mr. Rodger will coordinate sales of Formax polishing and buffing compounds and buffing wheels, through Formax factory representatives and distributors.

★ ★ ★

Appointments of factory representatives for Illinois and Michigan have been announced by **Chicago Rubber Company,** Waukegan, Illinois. The firm makes rubber contact wheels for abrasive belts, as well as industrial rolls, pulleys, office equipment platens, printing rolls, and molded rubber products.

Frank N. Capparelli will cover Illinois from headquarters at 15 S. Austin Blvd., Chicago 44. **James A. Belanger,** 15620 Meadowood, Royal Oak, Michigan, becomes Michigan representative.

★ ★ ★

Arthur R. MacNeil, New England sales manager for **MacDermid Incorporated,** Waterbury, Connecticut, has been named vice-president of the company. Mr. MacNeil will continue as New England sales manager along with his new duties as vice president.

★ ★ ★

Robert B. Reed has been appointed chief engineer of **Paasche Airbrush Co.,** a division of Cline Electric Manufacturing Co., Chicago.

Robert B. Reed

Stuart W. Rodger

Mr. Reed brings to Paasche Airbrush Co. 15 years of varied engineering, management and manufacturing background including associations with Western Electric Company and McKinsey & Company, Inc.

★ ★ ★

Edward L. Carlson, advertising manager of **Oakite Products, Inc.,** has been placed in overall charge of the company's informational efforts in the industrial cleaning and metal finishing fields.

Mr. Carlson, who joined Oakite in 1924 and has served as both copywriter and production manager, was promoted to advertising manager in 1947. In his new capacity he will supervise the company's activities in industrial trade shows and special promotions, as well as trade paper advertising and associated activities.

MIRACLE PAINT REJUVENATOR

All paint restored to original consistancy without opening can. 2 minutes per gal. AVAILABLE ¼ PT. to 55 GALS.

55-GAL. MODEL

MIRACLE PAINT REJUVENATOR COMPANY
127 E. 9th St., St. Paul 1, Minn.

For more data circle **422** on Reader Service Card

The promotion of **W. K. Venatta** to manager of **Oronite Chemical Company's** Oak Point, La., plant has been announced by T. G. Hughes, president, Oronite Chemical Company. He succeeds **T. I. Clausen,** who is being transferred to California Research Corporation.

★ ★ ★

R. C. Perry has been appointed general sales manager of **The Diversey Corporation,** succeeding B. B. Button, who was made vice president of sales on January 1. Mr. Perry, formerly Pacific Division manager, has been with the company for 15 years.

J. M. Sharp has been made eastern regional manager; **J. K. Bradford, Jr.,** southern regional manager, and **J. R. McBrien,** Pacific regional manager.

Mr. Sharp's new eastern region is comprised of the New England Division, directed from Boston by F. E. Hartig, and the Eastern Division headed by H. J. Lisbeth in Newark.

The Southern Region, guided by Mr. Bradford, has been formed from Diversey's present Southwestern Division under H. B. Conrad, plus the Southern Division directed by **W. G. Rainey,** who has been appointed division manager.

Two new divisions have been created to form the Pacific Region. The Southern Pacific Division, with headquarters in Los Angeles, is under the supervision of new division manager **F. G. Morgan.** Frank Berus heads the Northern Pacific Division from San Francisco.

R. C. Cheek, formerly a Pacific Division district manager, now directs the North Central Division, succeeding Mr. McBrien.

Four new appointments as district managers also have been announced.

W. D. Funston is the new district manager in the Pacific Northwest. In San Francisco, **Sam K. Smith** heads the district while **J. T. Hardy** directs the Philadelphia District. The Omaha District will be in charge of **Perry Edman.**

John C. Vogel

R. C. Perry

John C. Vogel has been named a sales representative for **The Stanley Chemical Company,** a subsidiary of The Stanley Works, East Berlin, Conn.

Mr. Vogel will represent Stanley Chemical in its northern New Jersey territory.

★ ★ ★

Five new sales personnel appointments have been announced by the **Binks Manufacturing Company,** Chicago, Ill.

William Quayle has been appointed to the Binks branch office in Long Island to serve the Buffalo and New York state area. He replaces **George Sherwood** who will work in the Columbus, Ohio, area, out of Binks' Cleveland branch.

Jerry Little has been added to the sales staff of the Dallas, Texas, branch. Mr. Little will assist Milo Scully, branch manager, in representing Binks' products in the Texas, Louisiana, and Arkansas areas.

Telephone collect for free brochure on
STRIPPING COPPER
with
McKeon's "Liquid Sulphur"
Economical, fast, non-electrolytic.
Sulphur Products Co., Inc.
McKeon Bldg., 621 W. Pittsburgh St., Greensburg, Pa.
For more data circle 423 on Reader Service Card

Ralph Kelly has been appointed to the sales staff of the Milwaukee branch, but will be located in St. Paul and will work in adjacent territories.

Charles Fawks has been named to Binks' St. Louis office to cover Iowa and surrounding areas.

★ ★ ★

L. J. Edwards

Leonard J. Edwards has been appointed manager of the Furnace and Oven Division of **W. S. Rockwell Company,** Fairfield, Connecticut. Mr. Edwards was previously vice-president of C. I. Hayes, Inc., Providence, R. I., and sales engineer for General Alloys Company, Boston.

★ ★ ★

New assignments have been announced for two branch-office sales managers and a technical sales representative, all of **Hercules Powder Company's** Synthetics Department.

Frank H. Crymes has been named manager of sales training for the Synthetics and Cellulose Products Department. Mr. Crymes has been manager of the Synthetics Department's Chicago district for the past three years.

B. J. Dougherty, formerly manager of the department's St. Louis district, has been named to succeed Mr. Crymes as manager of the department's Chicago district.

James G. Antonak has been named technical sales representative in the St. Louis district. For the past five years he occupied a similar position in the Chicago sales district.

★ ★ ★

Dr. Clarence A. Stiegman has been named director of product development of **Hooker Electrochemical Co.,** Niagara Falls, N. Y. In this capacity Dr. Stiegman will direct product development of both the chemical and plastics elements of Hooker's business. He was vice president and technical director of Oldbury Electro-Chemical Co. prior to its consolidation into Hooker on November 29.

Dr. Stiegman came to Oldbury in 1937 as technical assistant to the production manager, and has served as manager of new product development, assistant secretary, secretary, and manager of technical sales service. In 1950 he was elected to the board of directors and was also appointed director of technical service. Since 1953 and until the consolidation he was vice president and technical director.

★ ★ ★

Enthone, Inc., New Haven, Conn., a subsidiary of American Smelting & Refining Company, has announced the

WORDS SPEAK LOUDER THAN MONEY

The owner* of a well known N. Y. job shop in enrolling for ELECTROPLATING KNOW HOW, writes: "My foreman has gotten such a good electroplating background from your course that I feel it imperative to take the course myself. Enclosed find my tuition check." Need any more convincing about enrolling yourself? Write . . . **Joseph B. Kushner, Electroplating School, 115 Broad St., Stroudsburg 1F, TODAY!**
*Name on request

For more data circle **424** on Reader Service Card

reassignment of some of its technical personnel.

A. Robert Tefft becomes resident service engineer in the Midwest. Mr. Tefft will supplement the service previously given by Robert Goodsell. He will have his headquarters at the offices and laboratory of Ardco, Inc., Chicago, Illinois.

Robert Goodsell becomes senior resident engineer of the same area. Mr. Goodsell will continue to have his headquarters at Ardco, Inc., Chicago, Ill.

A. Harry Sanders has been made district manager for northern Connecticut and the Springfield-Holyoke area. Mr. Sanders will be assisted by **Frank A. Schneiders** as sales and service engineer in the same area.

★ ★ ★

Appointment of **Robert W. Saxton** as assistant general sales manager has been announced by S. J. Stowell, general sales manager, **Tranter Manufacturing, Inc.**

Mr. Saxton joined Tranter in January, 1953, as sales manager for the Contract Division, after having served as district sales supervisor for the U. S. Gypsum Company of Chicago.

J. W. Britton

Robert W. Saxton

J. W. Britton has been appointed director of the metal decorating finishes department of **The Hanna Paint Manufacturing Company,** Columbus, Ohio.

Mr. Britton has been active in the protective coating industries for the past twenty years, the last fifteen years of which have been devoted to metal decorative coatings.

TRAINING COURSES

A 12-week course of study in electroplating will start on the evening of September 17, 1957, at **Mumford High School** in **Detroit, Mich.** This course will be a basic science course to furnish information relating to electrochemistry and plating. It will provide scientific background to better understand the reactions and information available on plating processes.

The course will describe the various laws and principals involved with demonstrations and/or laboratory work as may be required. It is not designed to solve plant problems but to provide information to assist people in solving problems for themselves.

This electroplating course is being offered by the Adult Education Division of the Detroit Public Schools, and all fees, rules and regulations will be the same as the normal night school program. The specialized training is being offered at the request of the Detroit Branch of the American Electroplaters' Society, whose members and friends have indicated an interest in this type of course.

Further details on the course are available from Instructor John H. Strandberg at Mumford High School, 17525 Wyoming. The course will meet from 7:00 to 9:30 P.M.

MEETINGS

The American Hot Dip Galvanizers Association, Inc., will hold its 1957 Semi-Annual Meeting on September 26 and 27 at the Netherland-Hilton Hotel, Cincinnati, Ohio.

Attendance outside the membership is by invitation only, which may be extended to those concerns operating a hot dip galvanizing facility, if request is made in advance of the meeting. Contact American Hot Dip Galvanizers Association, Inc., 1506 First National Bank Bldg., Pittsburgh 22, Pennsylvania.

NECROLOGY

Joseph R. Esposito

Joseph R. Esposito, one of the leading figures in the Industrial Finishes business, died August 5 in New York City, after an illness of several weeks. He was 72.

Mr. Esposito was elected a director of **Interchemical Corporation** in 1935 and later a vice president. He held these positions until 1950. He had served as a consultant to Interchemical for the past seven years, specializing in the metal-decorating industry. He was honored recently for fifty years of service to the Industrial Finishes industry.

Mr. Esposito took the lead in founding the Industrial Finishes Division of the National Paint Varnish & Lacquer Association, Inc., in 1933.

★ ★ ★

Roger W. Straus

Roger William Straus, who retired from his post as chairman of the board of **American Smelting and Refining Company** in April, died suddenly on Sunday, July 28. He was 65 years old.

At the time of his death, he was a director of the company, and also of Revere Copper and Brass, Inc., General Cable Corporation, New York Life Insurance Company and New York Telephone Company. He was chairman of the executive committee of Revere and General Cable.

Edward J. Bothwell, New Brighton, Staten Island, New York, in charge of the Distributor Sales Section of the Nickel Sales Department of **The International Nickel Company, Inc.,** died July 24th at the Staten Island Hospital after a brief illness. He was in his 57th year.

MEETINGS of INTEREST to FINISHERS

Sept. 26-27. Semi-Annual Meeting, American Hot Dip Galvanizers Association, Inc., Netherland-Hilton Hotel, Cincinnati, Ohio.

Oct. 6-10. Fall Meeting, Electrochemical Society, Statler Hotel, Buffalo, N. Y.

Oct. 9-11. 4th Annual Symposium of High Vacuum Technology, Hotel Somerset, Boston, Mass.

Oct. 21-24. 60th Annual Conventional, International Association of Electrotypers and Stereotypers, Inc., Americana Hotel, Miami Beach, Fla.

Oct. 30-Nov. 2. 22nd Paint Industries' Show and 35th Annual Meeting, Federation of Paint and Varnish Production Clubs, Bellevue-Stratford Hotel, Philadelphia, Pa.

Nov. 2. Annual Educational Session and Banquet, Philadelphia Branch, A.E.S., Penn-Sheraton Hotel, Philadelphia, Pa.

Nov. 4-8. 39th National Metal Congress and Exposition, International Amphitheatre, Chicago, Ill.

Nov. 6-8. 19th Annual Shop Practice Forum, Porcelain Enamel Institute, Ohio State University, Columbus, Ohio.

Feb. 3-6. National Industrial Electric Heating Conference, Netherland-Hilton Hotel, Cincinnati, Ohio.

Feb. 10-14. Committee Week, American Society for Testing Materials, Statler Hotel, St. Louis, Mo.

Feb. 14-15. Third Annual Technical Session and Banquet, Southeastern Branch, A.E.S., Dinkler Plaza Hotel, Atlanta, Ga.

May 19-22, 1958. 45th Annual Convention, A.E.S., Hotel Sheraton-Gibson, Cincinnati, Ohio.

For Free Literature Circle Numbers on Card Inside Front Cover

PRODUCT LITERATURE

36. Vapor Degreasing Manual
A 32-page manual on vapor degreasing. Circo Equipment Co., 124 Central Ave., Clark (Rahway), N. J.

37. Plastic Coating Process
Information on a process by which nylon and other plastics can be applied to metal and ceramic parts. Lehigh Research & Development Corp., 2121 S. 12th St., Allentown, Pa.

38. Sanding Machine
Information on air-operated portable sanding machines. Detroit Surfacing Machine Co., 1266 E. Eight Mile Rd., Detroit 20, Mich.

39. Rhodium Plating Solutions
Literature describes company's line of rhodium plating solutions. Sigmund Cohn Mfg. Co., Inc., 121 S. Columbus Ave., Mount Vernon, N. Y.

40. Wash Primer
Literature and technical data on Vinsynite wash-primer-type pretreatment for increasing corrosion resistance, adhession. Thompson & Co., 1010 Allegheny Ave., Oakmont, Pa.

41. Heating Process Solutions
A 52-page book gives technical information on the Dean Thermo-Panel Coil. Dean Thermo-Panel Coil Div., Dean Products, Inc., 622 Franklin Ave., Brooklyn 38, N. Y.

42. Buffing Compound
Data on the advantages of using Stutz Liquispray buffing compound. The Stutz Co., 4410 Carroll Ave., Chicago 24, Ill.

43. Electropolishing Stainless Steel
Describes baths used for electropolishing stainless steels, includes operating instructions for two of these baths. Electro-Glo Co., 1429 S. Talman Ave., Chicago 8, Ill.

44. Tack Cloth
How to produce a higher-quality finish by using chemically treated cloths to wipe off dust and dirt just prior to paint finishing. Bond Chemical Products Co., 2639 N. Clybourn Ave., Chicago 14, Ill.

45. Paint Arrestors
Information on RP Paint Arrestors, which filter out overspray paint from spray booth exhaust air, are easily replaceable. Research Products Corp., Dept. 38, Madison 10, Wisconsin.

46. Barrel Finishing Booklet
Booklet describes barrel finishing equipment and materials and how to use them. The Abbott Ball Co., 1064 New Britain Ave., Hartford 10, Conn.

47. Ovens
Catalog describes and illustrates various types and sizes of paint-baking ovens. Lanly Co., 760 Prospect Ave., Cleveland, Ohio.

48. Metal Cleaners
Information on a complete line of metal-cleaning chemicals. Metal Processing Dept. 468, Pennsalt Chemicals Corp., 3 Penn Center, Philadelphia 2, Pennsylvania.

49. Humidifiers
Form A-1429 discusses Aprilaire Industrial Humidifiers, designed to produce constant relative humidity, under complete automatic control. Research Products Corporation, 1015 E. Washington Ave., Madison 10, Wisconsin.

50. Temperature Control
Bulletin S-1498 describes Sarco self-powered type TR-19 plating tank temperature control. Sarco Co., Inc., Empire State Bldg., New York 1, N. Y.

51. Rust Prevention
Technical data on Rustgard, a material that is sprayed on ferrous metals to give temporary rust protection or used as a final finish over conversion coatings. Heatbath Corporation, Springfield 1, Mass.

52. Brass Additive
Information on an additive for brass plating solutions that is said to increase efficiency and throwing power. Jelco Finishing Equipment Corp., 153 E. 26th St., New York 10, N. Y.

53. Nozzles
Catalog 24 describes nozzles designed for use in washing, flow coating and rinsing operations. Spraying Systems Co., 3229 Randolph St., Bellwood, Ill.

54. Paint Hose
Information on a paint hose with improved resistance to solvents. The DeVilbiss Co., Toledo 1, Ohio.

55. Cleaning Compound
Data on Apex RPS cleaning compound, designed for heavy-duty soak and electrolytic cleaning of ferrous metals. Apex Alkali Products Co., Main and Rector St., Philadelphia 27, Pa.

56. Ovens
Catalog describes and illustrates various models of convection baking ovens. W. S. Rockwell Co., 2907 Eliot St., Fairfield, Conn.

57. Plating Rectifiers
Literature describing various models of Clinton Rectifiers incorporating Dual-O-Matic Voltage Selector Circuit, which allows the maximum name-plate voltage to be drawn on either the two- or 12-volt operating range without reconnecting external d.c. connections. Clinton Supply Co., Rectifier Manufacturing Div., 110-112 S. Clinton St., Chicago 6, Ill.

58. Copper Anodes
Data sheet describes Sphere-O-Forged Copper Ball Anode, which is said to plate rapidly and evenly with a minimum of scrap loss. Chase Brass & Copper Co., Inc., Waterbury 20, Conn.

59. Cleaning Compounds
Information on Dow sodium orthosilicate and caustic soda for use in metal-cleaning compounds. Dow Chemical Co., Dept. AL 611L-1, Midland, Mich.

60. Plating and Anodizing Racks
Booklet entitled "Take a Tip From Naraco" includes data on the proper type of rack to be used for depositing various metals, illustrates many types of rack construction for plating and anodizing different shapes. International Rack Co., Inc., 3712 National Highway West, Springfield, Ohio.

61. Demineralizers
Bulletin No. 200 discusses principle of demineralization, advantages, uses and applications, construction, capacity, etc. Industrial Filter & Pump Mfg. Co., 5904 Ogden Ave., Chicago 50, Ill.

62. Barrel Finishing Equipment
Data sheet gives specifications for various models in the line of Globe Power-Tilt Precision Barrel Finishing Machines. Globe Div., Casalbi Co., 546 Wayne St., Jackson, Mich.

63. Acid-Resistant Work Clothes
Complete description of acid-resistant work clothes, together with laboratory reports on technical properties of the fabrics used. Worklon, Inc., Dept. P-PF, 253 W. 28th St., New York 1, N. Y.

64. Anti-Mist Additive
Technical Bulletin CR-HT describes Zero-Mist HT for chromium plating baths, a surface active additive for chromium plating baths. This additive is said to produce a foam blanket on chromium plating baths that will eliminate mist and spray, regardless of operating temperature. Udylite Corp., Detroit 11, Mich.

65. Fire-Resistant Buffs
Literature on buffs made by a process that makes them have better resistance to fire. Schaffner Manufacturing Co., Inc., Emsworth, Pittsburgh 2, Pa.

66. Aluminum Corrosion Protection
Form A-6790 describes the Bonderite 700 Series of conversion coatings for protection of aluminum from corrosion. This bulletin describes methods of application, shows color produced, discusses applications, demonstrates corrosion protection imparted by this coating. Parker Rust Proof Co., 2172 E. Milwaukee, Detroit 11, Mich.

67. Germanium Rectifiers
A line of self-contained germanium rectifiers is described. Special advantages and outstanding features of these units are listed, including details on output control and starter, transformer and junction design. Ratings and specifications are included for four models: 750, 1500, 2500 and 5000 amperes. Hanson-Van Winkle-Munning Co., Inc., Church St., Matawan, N. J.

68. Heat for Plating Baths
Publication GER-1333, a technical article giving basic criteria for selection of tubular heaters for plating baths. Includes information on installation, insulation, power requirements, and maintenance. General Electric Company, Schenectady 5, N. Y.

69. Buffing Compositions
Booklet contains recommendations on the type of compound to be used on a specific job as well as a table giving the correct surface speed of a buffing wheel in feet per minute. The Buckeye Products Co., 7027 Vine St., Cincinnati 16, Ohio.

70. Paint Base
Bulletin 1380 describes the various types of ACP Granodine and gives information that helps to select the proper one for a particular application. American Chemical Paint Co., Ambler 14, Pa.

71. Bright Nickel
Literature on Harshaw Nubrite, a bright nickel solution that is said to have excellent leveling properties; plate out bright over a wide range; have high tolerance to impurities; produce better brightness with thinner deposits; and remain ductile after long operation. The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.

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72. Tumbling Abrasives
Folder describes complete line of aluminum oxide tumbling abrasives. Exolon Co., 943 E. Niagara, Tonawanda, N. Y.

73. Cleaner
A general-purpose cleaner to remove oils from steel, brass and base metals is described in Technical Data Sheet No. 47, a usage and instruction sheet. Called Metalex W Special, the cleaner is mildly alkaline and has a high percentage of wetting agent. Especially compounded to counteract hard water effects, Metalex W Special is a free-rinsing cleaner and tolerates prolonged transfer periods. It can be used as a soak, direct or reverse current cleaner, and activates bright nickel plate or buffed nickel before chrome plating. MacDermid, Inc., Waterbury 20, Conn.

74. Cold Cleaning Solvent
A booklet outlining properties and uses of chlorothene, Dow inhibited 1,1,1-trichloroethane. The Dow Chemical Co., Solvent Sales Dept., Midland, Mich.

75. Abrasive Belt Polishing Machines
Information on Hill Acme abrasive belt polishing machines for polishing flat surfaces of ferrous and nonferrous metals. The Hill Acme Co., 1201 W. 65th St., Cleveland 2, Ohio.

76. Acrylic Enamel
Literature on Duracron, a thermosetting acrylic enamel developed for finishing refrigerators, home laundry equipment, ranges and air conditioning units. Pittsburgh Plate Glass Co., Industrial Sales Div., 1 Gateway Center, Pittsburgh, Pa.

77. Continuous Paint Stripping
Technical information on RAP Tank Solvent No. 52, a solvent formulated to be used in continuous paint stripping installations. Pockrandt, Inc., 1108 Marquette St., Bay City, Mich.

78. Electrostatic Spray Painting
Ransburg No. 2 Process Brochure. Ransburg Electro-Coating Corp., Barth & Sanders, Indianapolis 7, Ind.

79. Organic Finish
Information on Egyptian 6-CN, a clear finish that air-dries quickly with little orange peel; produces an exceptionally light-colored film; dries tough and flexible; has good resistance to perspiration. Egyptian Lacquer Manufacturing Co., Box 444, Newark 1, N. J.

80. Metal Finishing Products
Enthone "check list" covers more than 60 products and processes developed for modern metal finishing and electroplating. Enthone, Inc., 442 Elm St., New Haven 11, Conn.

81. Tumbling Barrels
Catalog describes various models of the company's single- and variable-speed tumbling equipment. The Henderson Bros. Co., 134 S. Leonard St., Waterbury, Conn.

82. Precision Design Painting
A 20-page book describes spray masks for use on die castings that have depressed or raised detail. Wm. M. Fiore, Inc., 269 41st St., Brooklyn 32, N. Y.

83. Roller Coating
Fact file on the roller coating process includes information on how to form metal after finishing without harming the finish. Gasway Corp., 6465 N. Ravenswood Ave., Chicago 26, Ill.

84. Quartz Immersion Heaters
Bulletin describes complete line of quartz-sheathed immersion heaters, designed for service in corrosive chemicals. Glo-Quartz Electric Heater Co., Inc., Willoughby, Ohio.

85. Extrusion Finisher
Details on the Hammond Reversing Extrusion Finisher, designed to be used in finishing extrusions, trim and moldings. Hammond Machinery Builders, Inc., 1622 Douglas Ave., Kalamazoo, Mich.

86. Rust Remover
A folder describing Turco Alkaline Rust Remover, chemical compound that removes rust, paint and primer from metal surfaces in two simple steps without the use of acids. Turco Products, Inc., 6135 S. Central Ave., Los Angeles 1, Calif.

87. Paint Finishing Systems
Bulletin 51C contains 16 pages on modern ways to achieve better finishes, faster production and smoother handling of metal products at lower cost. Despatch Oven Co., 619 S. E. Eighth St., Minneapolis 14, Minn.

88. Vapor Degreasing Manual
A 42-page book of data and illustrations on the latest methods of cleaning metal. E. I. duPont de Nemours & Co. (Inc.), Electrochemicals Dept. PF, Wilmington 98, Del.

89. Spray-Booth Strip Coating
Data on a quick, easy way to keep spray booth walls clean, free of overspray. Better Finishes & Coatings, Inc., 268 Doremus Ave., Newark 5, N. J.

90. How to Select an Air Compressor
Booklet tells what to look for in an air compressor. Binks Manufacturing Co., 3118-40 Carroll Ave., Chicago 12, Ill.

91. Washing Machines
Literature describes a line of metal parts washing and surface-treatment machines. G. S. Blakeslee & Co., 1844 S. Laramie Ave., Chicago 50, Ill.

92. Tumbling Grains
Booklet A-1461 describes wide variety of sizes available. Carborundum Co., Niagara Falls, N. Y.

93. Polishing Machines
Information on tandem roll horizontal machines for cut-down and finishing of sheets, plates, extrusions, trim, etc. Central Machine Wks., 74 Commercial St., Worcester 8, Mass.

94. Alkali Cleaners
Information on a complete line of alkaline cleaning products. Detrex Chemical Industries, Inc., Box 501-A, Detroit 32, Mich.

95. Conveyorized Painting
Literature on cleaning, painting and baking equipment. Cincinnati Cleaning & Finishing Machinery Co., 2008 Hageman St., Cincinnati 41, Ohio.

96. Chromate Coatings
Reference file on Iridite Chromate Conversion Coatings gives information on a complete line of coatings for corrosion protection and for use as a paint base. Allied Research Products, Inc., 4004-06 E. Monument St., Baltimore 5, Md.

97. Corrosion-Proof Tank Lining
Technical data on Amer-Plate Vinyl sheet, a tank lining that is molded under pressure and heat to give maximum corrosion protection. Amercoat Corp., Dept. EI, 4809 Firestone Blvd., South Gate, Calif.

98. Phosphorized Copper Anodes
Description of Anaconda "Plus-4" Copper Anodes, which are said to produce less sludge, give a copper plate of improved uniformity and density. American Brass Co., Waterbury 20, Conn.

99. Buffs
Literature describes bias cloth, bias sisal and unit cloth or sisal buffs. American Buff Co., 2414 S. LaSalle St., Chicago 16, Illinois.

100. Automatic Polishing
Data on automatic polishing and buffing machines, including rotary indexing, conveyorized straightline types. Acme Manufacturing Co., 1400 E. Nine Mile Rd., Detroit 20, Mich.

101. Complete Finishing Systems
Catalog describes ovens, heaters, air-make-up systems, spray booths and washers. Burdett Manufacturing Co., 4916 S. Monitor Ave., Chicago 38, Ill.

102. Cleaner
Literature on Cowles NS cleaner. Cowles Chemical Co., 7016 Euclid Ave., Cleveland 3, Ohio.

103. Silver Anodes
Data on shaped, extruded APW Silver Anodes, which are said to have controlled grain size that minimizes shedding. American Platinum Works, 231 New Jersey Railroad Ave., Newark 5, N. J.

104. Spray Booth Filters
Information on Delpark Paint Spray Booth Filters for removing the overspray particles from water used in the water curtains of water-wash spray booths. Industrial Filtration Co., 166 Industrial Ave., Lebanon, Ind.

105. Industrial Ovens
"Ovens for Industry" catalog describes many types, models and sizes of convection ovens. Kirk & Blum Manufacturing Co., 3116 Forrer St., Cincinnati 9, Ohio.

106. Pearlescent Finishes
Information on Nacromer YNC, an additive that is used in standard organic finishes to produce a pearlescent finish. The Mearl Corporation, 124 E. 40th St., New York 16, N. Y.

107. Rack Coating
Information on Unichrome Coating 218X, a vinyl plastisol specifically formulated for use in protecting plating racks. Metal & Thermit Corporation, Rahway, N. J.

108. Cleaner-Phosphatizing Compound
Literature on Divobond, a compound that is said to be so effective that only one pound is required to clean and phosphatize 1,000 square feet of work. Diversey Corporation, 1820 Roscoe St., Chicago 13, Ill.

109. Infrared Oven Panels
Engineering data on infrared oven panels that can be assembled to make a baking or drying section of almost any shape or size. Dry Clime Lamp Corp., Greensburg, Indiana.

110. Anodes
Information on copper, nickel and zinc anodes. New Jersey Metals Co., 724 Rockefeller St., Elizabeth 2, N. J.

111. Tumbling Abrasives
Literature on Norton tumbling abrasives. Norton Co., Abrasives Div., Worcester 6, Mass.

112. Isophthalic-Based Coatings
Information on the advantageous features of coatings based on Oronite isophthalic acid. Oronite Chemical Co., 200 Bush St., San Francisco, Calif.

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For Free Literature Circle Numbers on Card Inside Front Cover

113. Copper and Nickel Sulfate
Information on Triangle Brand copper and nickel sulfates, for use as sources of copper and nickel in plating. Phelps Dodge Refining Corp., 300 Park Ave., New York 22, N. Y.

114. Aluminum Cleaners
Literature on a line of cleaners and etching compounds formulated specifically for use on aluminum alloys prior to plating, anodizing, painting or welding. Northwest Chemical Co., 9310 Roselawn Ave., Detroit 4, Mich.

115. Degreaser
Technical data on the Phillips 100 CS degreaser, a complete unit that has cool and hot rinse, along with vapor degreasing. Phillips Manufacturing Co., 3457 W. Touhy Ave., Chicago 45, Ill.

116. Work Gloves
Industrial glove catalog describes line of gloves designed for various industrial tasks. Pioneer Rubber Co., 285 Tiffin Rd., Willard, Ohio.

117. Rust Remover
Description of Metalprep Rust Remover. Neilson Chemical Co., 6561 Benson St., Detroit 7, Mich.

118. Contact Wheel
Folder on the E-Z Cut Wonder Wheel includes description of unusual features of this wheel and illustrations to show construction. Mermac Products, Inc., 515 N. Racine Ave., Chicago 22, Ill.

119. Paint Stripping
Data on the company's service of reporting on methods for stripping a specific piece of work submitted by the user. DuBois Co., Inc., 1120 W. Front St., Paint Stripping Clinic, Cincinnati 3, Ohio.

120. Deburring Barrel
Information on the Ransohoff Automatic Media Return Cleaning and Deburring Barrel. Work is washed while it is being deburred. Ransohoff, Inc., 610 N. Fifth St., Hamilton, Ohio.

121. Why Hot Spray?
Booklet includes detailed case-history facts and figures on hot-spray benefits. Spee-Flo Manufacturing Corp., 720 Polk Ave., Houston, Texas.

122. Compressively Stressed Rhodium
Information on Sel-Rex Rhodex, a rhodium electroplating process that yields compressively stressed deposits. Sel-Rex Corporation, Dept. PF 9, Nutley 10, N. J.

123. Industrial Ovens
Bulletin 200 describes complete line of industrial ovens. W. W. Sly Manufacturing Co., 4784 Train Ave., Cleveland 1, Ohio.

124. Barrel Finishing Processes
Technical data folder describes Roto-Finish barrel finishing processes. Roto-Finish Co., P. O. Box 988, 3704 Milham Rd., Kalamazoo, Mich.

125. Conveyor-Line Paint Stripping
Description of Magnus 751, an additive that is used in alkaline cleaning solutions to give the speed and effectiveness necessary for continuous stripping of conveyor hooks, shields and other conveyor-line apparatus. Magnus Chemical Co., Inc., 208 South Ave., Garwood, N. J.

126. Air Engineering Folder
A 24-page Air Engineering Data File (Bulletin E-57) covers engineering and test facilities for propeller fans, specifications, construction, maintenance, and installation. Aerovent Fan Company, Inc., Piqua 63, Ohio.

127. Electrocleaning Die Castings
Booklet entitled "Good News About Electrocleaning Zinc-Base Die Castings." Oakite Products, Inc., 20 Rector St., New York 6, N. Y.

128. Rectifiers
Complete details on the Walker silicon, germanium and selenium rectifiers, all of which incorporate the Walker "Work Saver," which automatically cuts current back to a predetermined level whenever necessary to prevent work spoilage. Walker Div., Norma-Hoffmann Bearings Corp., Stamford, Conn.

129. Immersion Processing Machine
Illustrated folder on "Little Steve," an automatic plating and immersion-processing machine that is useful in anodizing, enameling, phosphatizing, black Japanning. Frederic B. Stevens, Inc., 1800 Eighteenth St., Detroit 16, Mich.

130. Air Sanders
Data on a line of pneumatically operated sanding machines. Sundstrand Magnetic Pneumatic Products, Div. of Sundstrand Machine Tool Co., 1020 Ninth St., Rockford, Ill.

131. Plating Rectifiers
Technical study shows the advantages of Ther Reactron Modimatic Controls for producing stepless control of rectifiers. Ther Electric & Machine Works, 13A S. Jefferson St., Chicago 6, Ill.

132. Infrared Heaters
Literature on Chromalox Far-Infrared heating equipment. Edwin L. Wiegand Co., 7522 Thomas Blvd., Pittsburgh 8, Pa.

133. Aerosol-Packaged Finishes
Literature on aerosol-packaged paints. Sprayon Products, Inc., 2077 E. 65th St., Cleveland 3, Ohio.

Classified Advertising

Services—Position Opportunities—Used Machinery and Equipment. For rates and other information address: **PRODUCTS FINISHING, 431 Main St., Cincinnati 2, Ohio**

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Where To Buy It

For sources of equipment, materials and processes used in the Finishing Industry, refer to the

Products Finishing DIRECTORY

OPPORTUNITY SECTION

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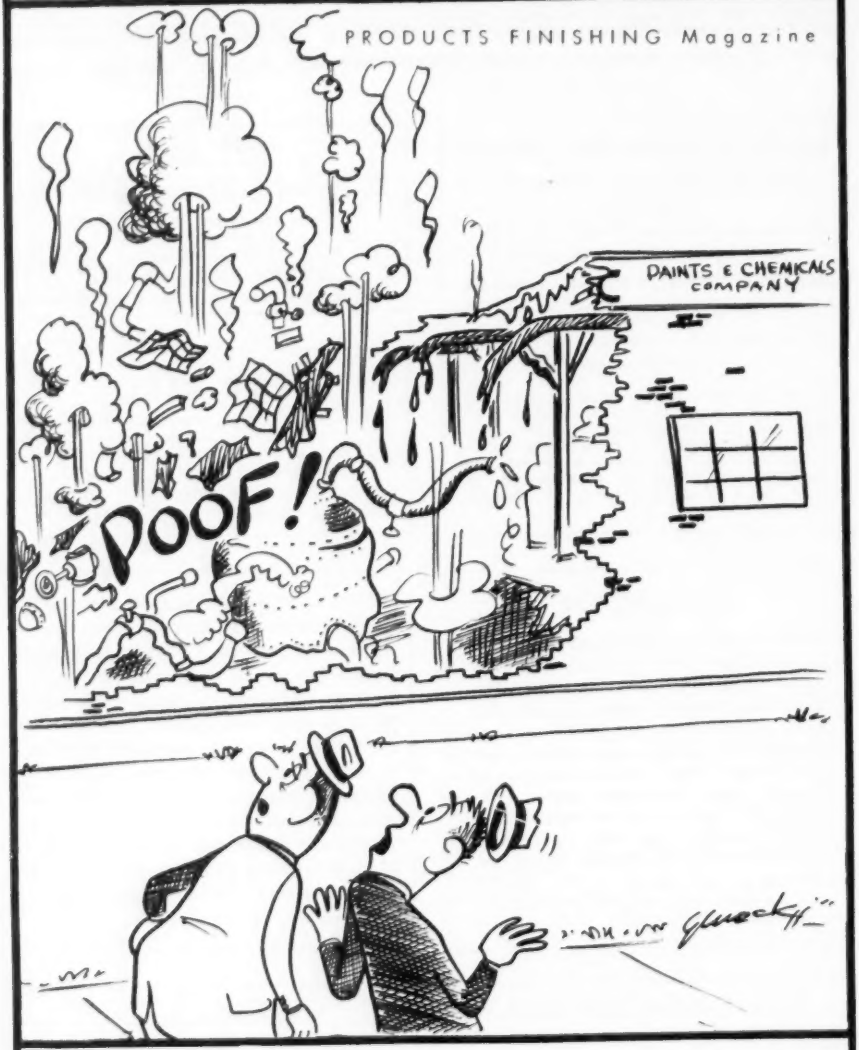

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September Advertisers' Index

Abbott Ball Co. 147
Acme Mfg. Co. 16, 17
Allied Research Products, Inc. 82, 83
Alsop Engr. Corp. 151
Amercoat Corp. 73
American Brass Co. 93
American Buff Co. 59
American Chemical Paint Co. 9
American Platinum Wks. 14
Apex Alkali Products Co. 110
Armstrong & White, Inc. 126

Bacon Felt Co. 94
Better Finishes & Coatings, Inc. 80, 81
Binks Mfg. Co. 106, 107
Blakeslee & Co., G. S. 175
Bond Chemical Products Co. 147
Brady Co., W. H. 146
Burdett Mfg. Co. 29
By-Buk Co. 154

Carborundum Co. 64-B,-C
Ceilcote Co., Inc. 122
Central Machine Wks. 99
Churchill Co., Inc., Geo. R. 6
Cincinnati Cleaning & Finishing Mchry. Co. 64-D
Circo Equipment Co. 114
Cleveland Process Co. 92
Clinton Co. 91
Cohn Mfg. Co., Inc., S. 140
Cowles Chemical Co. 30

Dean Thermo-Panel Coil Div. 102
Despatch Oven Co. 13
Detrex Chemical Industries, Inc. ..... Fourth Cover
Detroit Surfacing Machine Co. 132
DeVilbiss Co. 34, 35
Diamond Alkali Co. 103
Diversey Corp. 101
Dixon & Rippel, Inc. 157
Dow Chemical 48, 49, 97
Dry Clime Lamp Corp. 124
DuBois Co., Inc. 135

Egyptian Lacquer Mfg. Co. 18
Electro-Glo Co. 88
Enthone, Inc. 4
Exolon Co. 19

Fiore, Inc., Wm. M. 12
Fusion Metal Coating Co. 144

Gasway Corp. 117
Globe Div., Casalbi Co. 118
Glo-Quartz Electric Heater Co. 8

Hammond Mchry. Builders, Inc. 7
Hanson-Van Winkle-Munning Co. 3, 32-A,-B,-C,-D
Hardwood Line Mfg. Co. 148
Harshaw Chemical Co. 133
Heatbath Corp. 128
Henderson Bros. Co. 127
Hercules Powder Co. 129
Hill Acme Co. 131
Holland & Sons, Inc., J. 155

Industrial Filter & Pump Mfg. Co. 27
Industrial Filtration Co. 75

Jelco Finishing Equipment Corp. 98

Kalamazoo Tank & Silo Co. 130
Kirk & Blum Mfg. Co. 143
Kushner Electroplating School 165

Lanly Co. 162
Lehigh Research & Development Corp. 138
Lowe Bros. Co. 136, 137

MacDermid, Inc. ..... Third Cover
Magnus Chemical Co., Inc. 119
Marathon Metal Products 150
Mearl Corp. 11
Mechanical Process Co., Inc. 149
Metal & Thermit Corp. 24, 25
Michigan Chrome & Chemical Co. 21
Miracle Paint Rejuvenator Co. 163
Morse Mfg. Co., Inc. 158

Naz-Dar Co. 149
Neilson Chemical Co. 115
New Jersey Metals Co. 22
Northwest Chemical Co. 65
Norton Co. 2

Oakite Products, Inc. 1
Oronite Chemical Co. 33

Parker Rust Proof Co. 63
Pennsalt Chemicals Corp. 160, 161
Phelps Dodge Refining Corp. 28
Phillips Mfg. Co. 105
Pioneer Rubber Co. 123
Pittsburgh Plate Glass Co. 112, 113
Pockrandt, Inc. 15
Promat Div., Poor & Co. 130

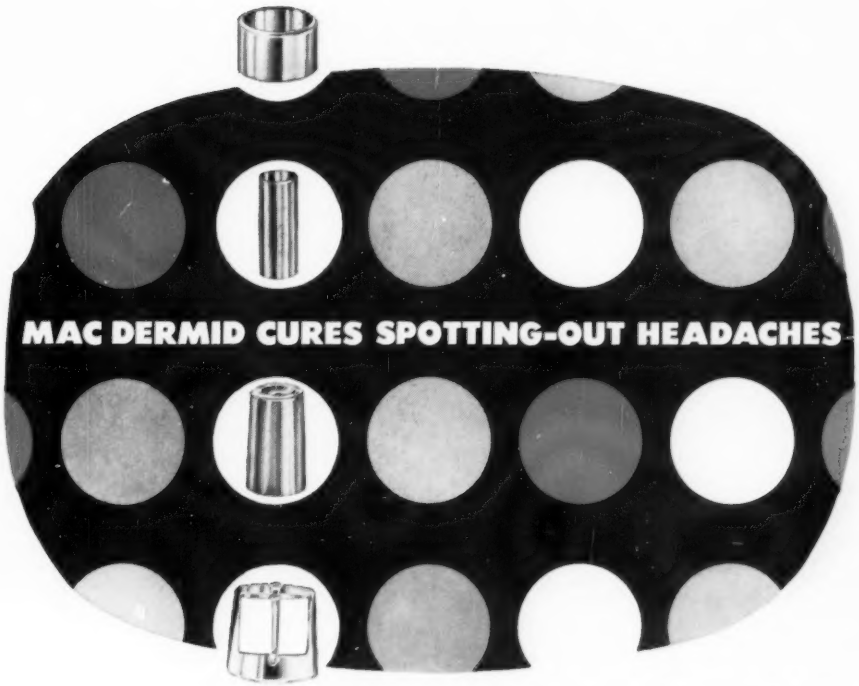
Randolph Products Co. 144
Ransburg Electro-Coating Corp. 67
Ransohoff, Inc. 77
Research Products Corp. 78, 104
Rockwell Co., W. S. 100
Roto-Finish Co. 141

Sarco Co., Inc. 95
Schaffner Mfg. Co., Inc. 145
Sel-Rex Corp. 139
Sethco Mfg. Co. 142
Sherwin-Williams Co. ..... Second Cover
Sly Mfg. Co., W. W. 26
Solvents & Chemicals Group 64-A
Spee-Flo Mfg. Corp. 71
Sprayon Products, Inc. 47
Stevens, Inc., Frederic B. 10
Stutz Co. 79
Sulphur Products Co. 164
Sundstrand Machine Tool Co. 89

Tenax Finishing Products Co. 159
Ther Electric & Machine Wks. 20
Thermal American Fused Quartz Co. 116
Thompson & Co. 156
True Brite Chemical Products Co. 142
Turco Products, Inc. 23

Udylite Corp. 125
Unit Process Assemblies, Inc. 134
Universal Paint & Varnish Co. 69

Walker Div., Norma-Hoffmann Bearings Corp. 121
Wiegand Co., Edwin L. 111
Worklon, Inc. 120



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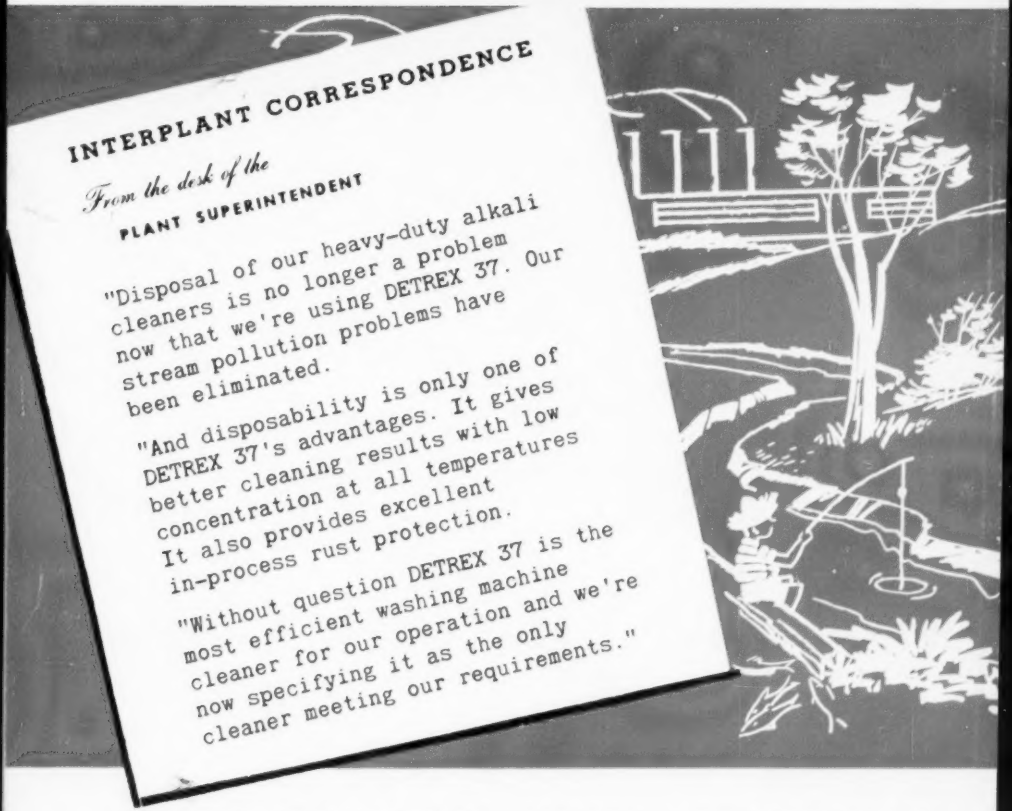
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"And disposability is only one of DETREX 37's advantages. It gives better cleaning results with low concentration at all temperatures It also provides excellent in-process rust protection.
"Without question DETREX 37 is the most efficient washing machine cleaner for our operation and we're now specifying it as the only cleaner meeting our requirements."

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